MARCH 1936

...aw Hill Co. of California

Price 25c Per Copy

ELECTRICAL WEST

WHEN the San Francisco - Oakland Bay Bridge opens to traffic in 1936, it will be more than a convenience to transportation. It will represent an electrical investment of $520,000 and a connected load of 356 kw. for lighting and power exclusive of its electric railway facilities.

Photo:

... Toll Bridge Authority

From Now until April 15
ONE OF THESE THREE
STARTS YOUR ALL-ELECTRIC KITCHEN
AND ANY ONE OF THEM WILL SAVE A WOMAN WORK AND WORRY AND COST SO VERY LITTLE
Cost No More to Buy Or Operate
BARGAIN OPPORTUNITY NOW
FREE PYREX
ELECTRIC RANGE OR WATER HEATER
AT YOUR DEALER
SOUTHERN CALIFORNIA EDISON COMPANY LTD.

That's all the time there is left in which to profit by Edison's big All-Electric Kitchen Campaign! Make the most of it!

Live, energetic dealers are tieing-in with our advertising—exerting extra sales effort—and playing sweet music on the cash register.

The Pyrex premium offer gives you an extra talking point — one more reason why your prospect should install a new electric range or water heater NOW — before April 15. Make the most of it!

Edison

CALIFORNIA'S *Electrical Age* HAS JUST BEGUN!

3-36

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ELECTRICAL WEST

With which are consolidated the "Electrical Journal," the "Journal of Electricity, Power and Gas," and the "Journal of Electricity."

ESTABLISHED 1887

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▼

• A CASE PROBLEM on the regulation of rural lines, first of a series of three practical experience articles by H. C. Minor, takes the theory of such procedure and puts it to work. Distribution engineers will find this both interesting and filled with practical methods, useful in the solution of similar problems on their own systems.

•

• SIDETRACKED ON A DETAIL, the industry missed the real point of a genuine business building idea. Mr. Harper repeats the idea and points to its business potential, reiterating the *inter*dependence of all in the industry upon the sale of *"result producers"*.

•

• SALES SHOWS of refrigerator manufacturers point to a windy year of arguments over details, with all makes just about neck to neck at the starting line with gadgets and features. The reviewer suggests that plenty of prospects will buy on just plain good refrigeration and what it means to health and happiness.

• SQUIRE BRIERWOOD pioneers a few sensational poultry electrification developments. Bill Jones is still convalescing and cannot rake the local manager over the coals as yet. Electra's Husband takes the well-publicized Skagit trip and wonders why more utilities are not better showmen.

•

• RANGES are featured in this month's APPLIANCE SALES GUIDE, and very little is overlooked in the suggestions for successfully selling this major load builder.

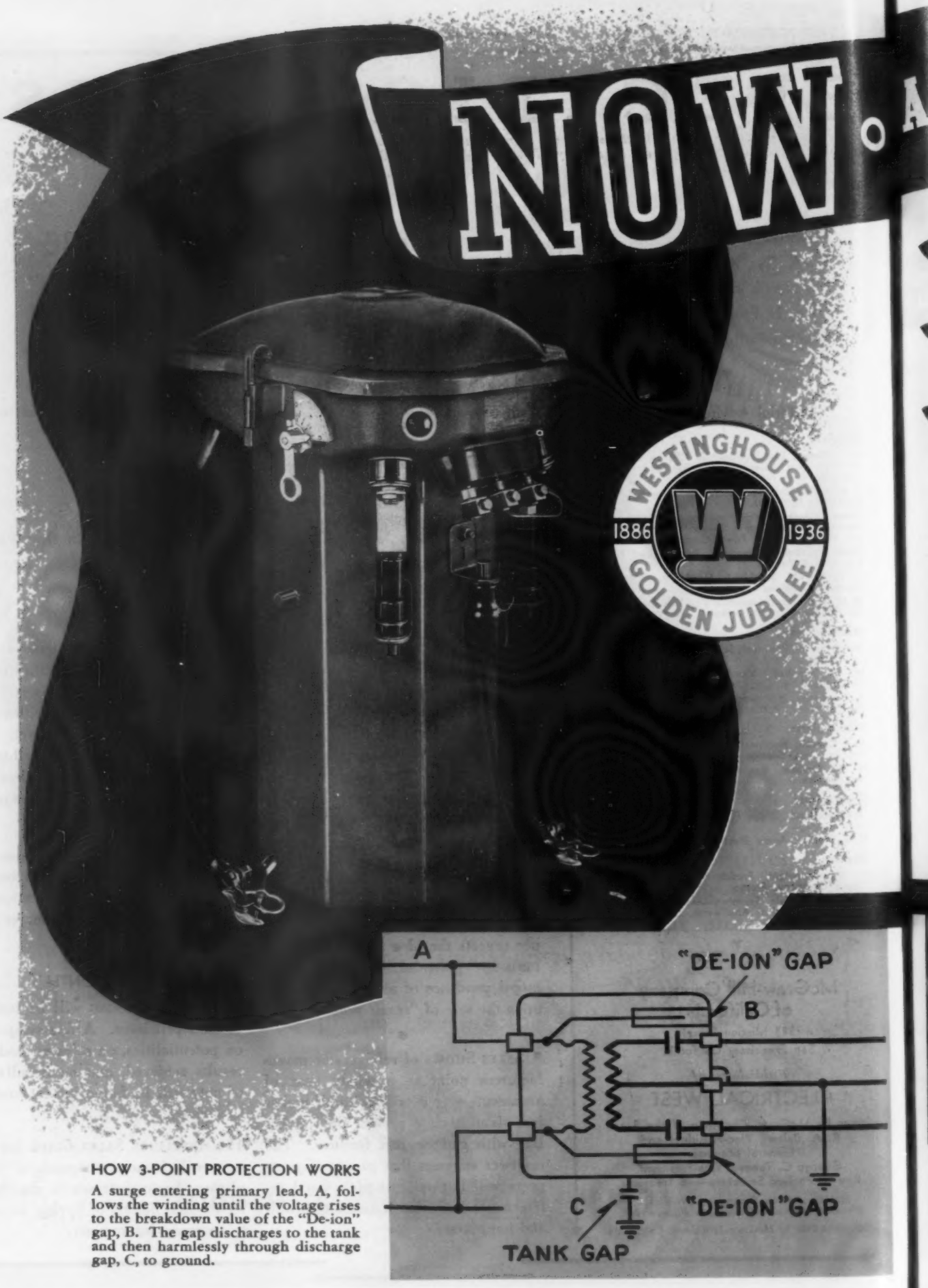
•

NEXT MONTH

• AIR CONDITIONING will be featured in the April issue. A fine symposium on potentialities, on sales methods, on results achieved, and on installations of note will be found in that number.

•

The APPLIANCE SALES GUIDE for that issue will feature refrigerators. Both of these begin their season shortly after the first flowers of Spring, in order to be ready for summer.



HOW 3-POINT PROTECTION WORKS

A surge entering primary lead, A, follows the winding until the voltage rises to the breakdown value of the "De-ion" gap, B. The gap discharges to the tank and then harmlessly through discharge gap, C, to ground.

A DISTRIBUTION TRANSFORMER

1 SELF-PROTECTING AGAINST LIGHTNING

2 SELF-PROTECTING AGAINST BURNOUT

3 PRACTICALLY OUTAGE PROOF

AFTER 5 years' engineering development and practical operating experience with surge protected transformers, including 2 years' field experience at various places with transformers that also are self-protecting against burnouts from either short circuits or overloads . . .

Now Westinghouse offers the entire electric light and power industry a transformer that actual service has proved to be practically outage proof and failure proof. Thousands of these CSP transformers are establishing unequalled records for service on urban, suburban and rural lines.

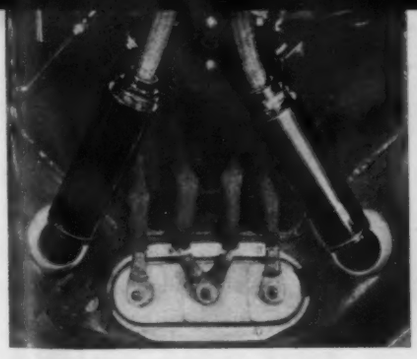
To the engineers in the electric light and power industry whose cooperation has made this achievement possible Westinghouse extends its thanks and appreciation.

Let the CSP prove itself on your lines. Apply some of these transformers on service where the operating conditions are unusually severe and see for yourself how well they perform.

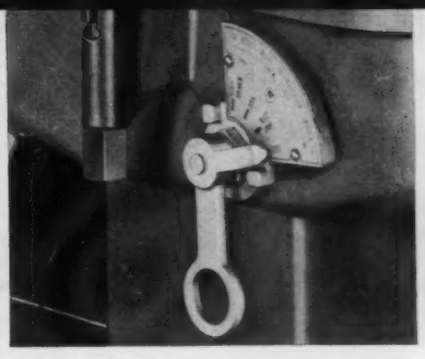
Remember, that in the final analysis the CSP is the lowest cost transformer you can install. Let our representative show you why, or write Westinghouse, Room 5-N, East Pittsburgh, Pa.

R 59027

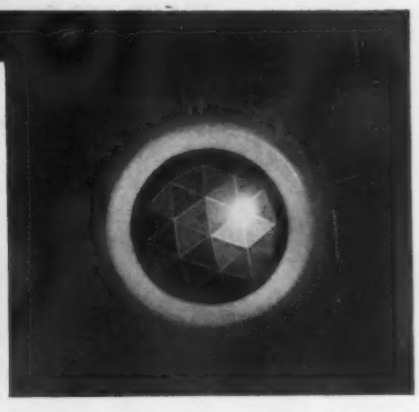
Westinghouse



3-Point Protection with "De-ion" gaps detours lightning surges to ground, and limits to a safe value voltage stress across insulation between (1) High-voltage winding and core or tank (2) Low-voltage winding and core or tank (3) High-voltage and low-voltage windings.



The circuit breaker in the secondary circuit gives positive protection against burnouts from either sustained overloads or short circuits. It can easily be reset by moving the external handle to the reset position and then to close.



The signal lamp gives visual indication of an overloaded transformer, and also serves as a tell-tale signal of a transformer whose breaker has tripped. Thus, load surveys in connection with CSP transformers can be eliminated.

UNIFO

A FUNDAMENTAL FEATURE

WHEN you build a power line, using Pyrex insulators, you need not worry about varying characteristics of the individual insulators.

Two factors assure this uniformity . . . two factors easily appreciated . . . two factors typical of Corning production, viz: Notably few manufacturing operations, and transparency.

Each operation in the manufacture of an insulator is an added hazard to uniformity. The few, necessary in Pyrex insulator production, aid in eliminating this hazard . . . and reduce production time to days.

It is usually the invisible defects that result in non-uniform service . . . defects not possible with Pyrex insulators since these are easily discerned by visual inspection in the factory.

"PYREX" is a registered trade-mark and indicates manufacture by

CORNING GLASS WORKS • CORNING, NEW YORK

PYREX POWER

ORMITY

E OF PYREX INSULATORS

The uniformity in color of Signal glassware has long been a Corning laboratory contribution to industry, and is a striking illustration of precision in Corning products.

RINSULATORS

DIRECT

THE NEW FRIGIDAIRE with the

Frigidaire launches its 1936 selling season with the most sensational new model, the most dynamic selling plans, in its entire history

● For months Frigidaire has been waiting for this day. For months feverish excitement has been growing . . . mounting toward the day when this smashing announcement could be made. And now Frigidaire proudly displays its sensational 1936 product — the New Frigidaire with the Meter-Miser. With it, Frigidaire introduces the most powerful, the most dramatic selling program ever devised to support a new product. The New Frigidaire is *new* . . . from stem to stern. And the plans that will help you sell more than you have ever sold before, are new plans . . . new methods for getting a greater share of refrigerator sales. The product, the plans, the sales program . . . everything . . . is set for the biggest year on record. Remember this slogan: "You'll Do Better with Frigidaire in '36!"

Buy on Proof!

For the first time in the industry, refrigerator prospects need not be forced to make their decision on blind faith or unsupported claims. Frigidaire's dramatic 1936 program provides a definite basis of comparison for buying an electric refrigerator the *Right Way* — on its ability to meet All Five Standards for Refrigerator Buying. Meeting one standard is not enough — for *complete* 1936 value your customers will demand *Proof* of All Five!

THE NEW

FRIGIDAIRE WITH THE "METER MISER"

MEETS *ALL* 5 STANDARDS FOR REFRIGERATOR BUYING

1. LOWER OPERATING COST
2. SAFER FOOD PROTECTION
3. FASTER FREEZING–MORE ICE
4. MORE USABILITY
5. FIVE-YEAR PROTECTION

FRIGIDAIRE'S FIGHTING CHALLENGE THAT SIGNALIZES EVERY 1936 ACTIVITY

Frigidaire has wrapped up its new product in a new story — a dramatic, smashing, aggressive advertising theme! In 1936 Frigidaire says: "You Can't Beat Proof!" "Buy on Proof!" Frigidaire, and every man who sells Frigidaire will be able to give proof, visual, convincing proof, that Frigidaire meets All Five Standards for Refrigerator Buying! Here is a stirring advertising story that ties together both the advertising and the demonstration. This complete co-ordinated program is a mighty selling tool with which Frigidaire men will go to town in 1936!

With the greatest product in its history, with the most forceful selling and merchandising plans on record, Frigidaire offers you the opportunity for your biggest refrigeration year.

MEET THE 1936 FRIGIDAIRE WITH THE "METER-MISER"

Look at the spectacular New Frigidaire with the Meter-Miser! Beautiful — eye-catching beauty! Crammed with new use-in-the-home conveniences. Wider, roomier, handier than ever! But even greater than these important selling features is the fact that *no refrigerator has ever performed as remarkably for so little operating cost!*

Frigidaire has built right into the product itself, selling features, unusual and compelling beyond all expectations. Beside the Meter-Miser there is the Food-Safety Indicator. A newly designed, handier-to-use, sealed Steel Cabinet, Sliding Shelves, Portable Utility Shelf, Automatic Interior Light . . . just about everything that has definite sales appeal—and this year Frigidaire has added the vital selling tool of a Five-Year Protection Plan for every purchaser of a Frigidaire.

THIS IS THE

"Meter-Miser"

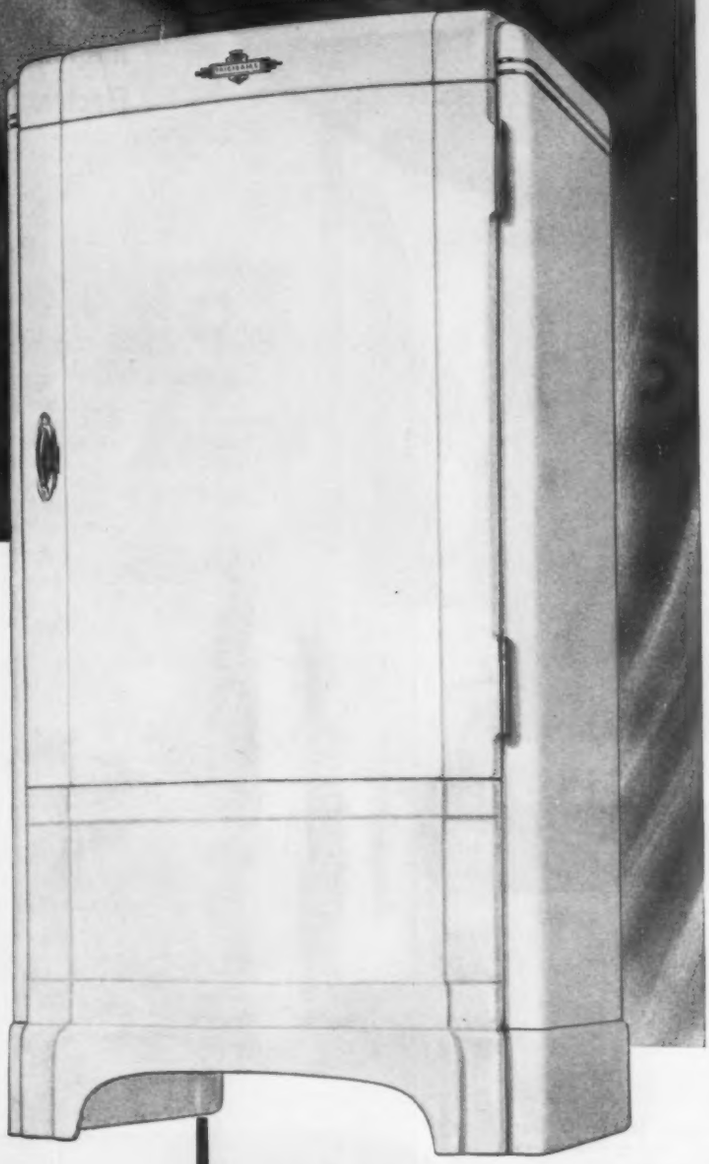
Frigidaire's new cold-making unit cuts current cost to the bone. Quiet . . . unseen . . trouble-free. Gives more cold for much less current cost, because of outstanding design that makes necessary only three moving parts, permanently oiled, precision built and completely sealed against moisture and dirt.

The New Food-Safety Indicator

Frigidaire is now equipped with this new Food-Safety Indicator, an accurate instrument built right into *the center of the food compartment*, giving visible proof that the *cabinet* is kept at Safety-Zone Temperature, below 50 degrees and above 32 degree

★ ★ ★

HIT! "METER-MISER"



Five-Year *Protection* Plan

Frigidaire places such faith and confidence in the Meter-Miser that this sealed-in mechanical unit, a marvel of outstanding design and engineering, comes to your customers protected for Five Years against service expense.

The New Name-Plate is a Salesman in Itself

Frigidaire is made *only* by the Frigidaire Division of General Motors Corporation. Your prospects are being educated to look for this name-plate before they buy.

The 1936 Frigidaire Line Includes

FOUR MASTER MODELS

from 4.1 to 7.24 cu. ft. capacity. All with Dulux Exterior, Stainless Porcelain in Seamless Interior and a long list of other superior advantages.

In addition there are the Koldchest, 2.1 cu. ft. capacity . . . and the D3-36, 3.3 cu. ft. capacity.

FIVE SUPER MODELS

from 4.1 to 9.1 cu. ft. capacity. All with Porcelain Exterior and Interior, Portable Utility Shelf, Hydrator and the Quickube Ice Tray, in addition to all other Frigidaire advantages.

FOUR EXTRA-SIZE AND DE LUXE MODELS

from 10 to 15.1 cu. ft. capacity.

TWO SPECIAL MODELS

5.1 and 6.24 cu. ft. capacity.

FRIGIDAIRE OFFERS THESE OUTSTANDING SELLING FEATURES

Meter-Miser · Food-Safety Indicator · Wider, Roomier Interior · Portable Utility Shelf · Full-Width Sliding Shelves · Automatic Interior Light · Frigidaire Hydrator · Super Freezer · Automatic Reset Defroster · Automatic Ice Tray Release · Quickube and Rubber Grid Ice Trays · "Double-Range" Cold Control · Sealed Steel Cabinet finished in Dulux or Porcelain · Touch-latch Door Opener · Exclusive "F-114" Refrigerant.

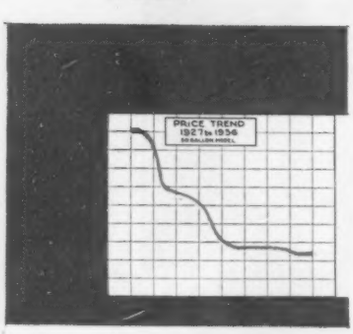
FRIGIDAIRE CORPORATION · DAYTON, OHIO

READY for a BIG YEAR

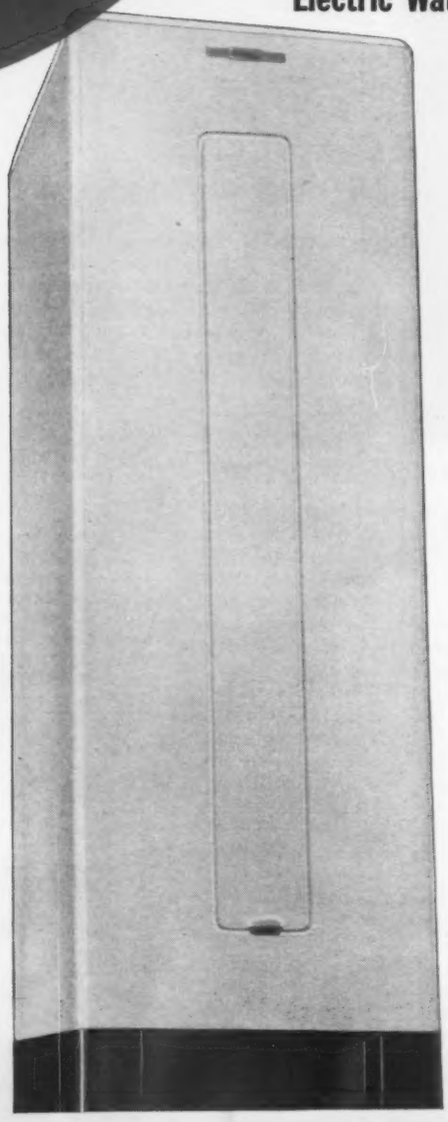
Complete NEW line of Water He

Hotpoint now offers the only complete line of rectangu Electric Water Heaters — at the lowest prices in histo

1927



Hotpoint Water Heater prices today are about half of the 1927 scale.



● Hotpoint's new *Vogue* rectangular model is sweepi the industry. Offered first in 1935 it won instant p ularity. Now Hotpoint offers the *Vogue* model in sixt different types and sizes. There are also six circular t heaters. Many sizes are available with twenty-y guaranteed MONEL metal tanks.

Compare the 1927 model Hotpoint Heater (at l with the stylish new *Vogue*. As values have gone Hotpoint prices have gone down.

5 REASONS for HOTPOINT LEADERSH

1. **Large scale manufacturing,** modern methods and eq ment permit volume production.
2. **Prices reduced** as much as $125.00 on some models to efficient manufacturing.
3. **Design—Foremost** in water heater styling, Hotpoint o the only complete line of rectangular water heaters the market.
4. **Vast improvements** in 1936 line—One piece copper ing hot water outlet. Built-in opening for temperat pressure relief valve. Concealed outlet box.
5. **Calrod,** Hotpoint's sealed electric unit, immersed wi the tank. It delivers all the heat generated directly to water. No heat is wasted.

The year 1936 will be a big one for building and modeling. People are spending and government acti is accelerating home modernizing. Hotpoint plans products help you "GET THE ORDER."

Hotpoint's "Old Faithful" Water Heater Campaign is complete and ready for you.

Look over the plan book. It contains a completely organized selling activity. You will find new and lively direct mail material, newspaper advertisements, outdoor posters, window display, a novel sales contest all ready to go to work for you.

EDISON GENERAL ELECTRIC APPLIANCE CO., INC.
5612 West Taylor Street, Chicago, Illinois

ELECTRIC WATER HEATERS Hotpoint

PRINT IN BINDING

NEW Electric Range Models

NEW Spring Sales Plan

THE DORIAN—Styled and priced to help you get volume business. Full size 39 in. wide with 16 in. oven. Work surface in center of range top. With 3 Hi-speed Calrod units and Thrift Cooker, list price . . . . **$99.75** f. o. b. Chicago

With 4 open coil units **$78.50**

THE BELMONT—A new Hotpoint style and price leader. Full size, all porcelain enamel. With 3 Hi-speed Calrod units and Thrift Cooker, list price **$128.00** f. o. b. Chicago

With 4 open coil units **$106.75**

THE STRATFORD—A newly styled quality range. Full porcelain enamel. With 3 Hi-speed Calrod units and Thrift Cooker, list price **$190.00** f. o. b. Chicago

All prices are f.o.b. factory at Chicago

point's new Electric Range models and com-tely organized selling plans will help you T THE ORDER" early. Here are three of newest models that will build volume sales you. Get your share of the money now being t for home equipment. See the new Hotpoint ges and Hotpoint's "Early Bird" sales plan April, May and June selling.

'Round Program. Five separate activities, each plete with special material, giving a well-organ-year 'round campaign.

onal Advertising. Full-page advertisements in the rday Evening Post, Ladies' Home Journal, Good sekeeping, McCall's and Better Homes and Gar-reach every other family in your community.

Early Bird Sales Plan. A complete Spring activity new direct mail material, novel sales contest, paper advertisements, outdoor posters, etc.

SON GENERAL ELECTRIC APPLIANCE CO., INC.
5612 West Taylor Street, Chicago, Illinois

Look over the EARLY BIRD PLAN BOOK for April, May and June. See the thoroughness with which the material is organized and made ready to go to work for you.

CALROD

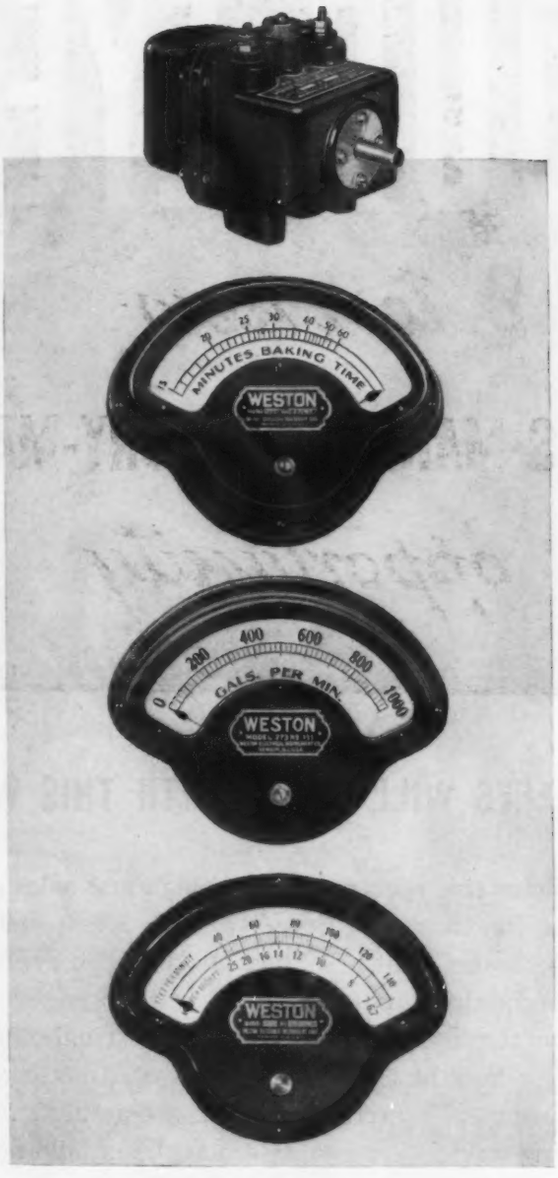
What Mazda means to light, Calrod means to cookery. The story of Calrod's speed, durability and long life is being told to the public through a series of color pages in the *Saturday Evening Post*. First ad March 21.

GET THE ORDER Now!

LECTRIC RANGES

Today we are building a better refrigerator than the world has ever known before. And we are telling the world about it as no refrigerator story has ever been told before. Today, to millions of people, one word means everything that is new and modern—everything that is beautiful and convenient—everything that is efficient and dependable in a refrigerator . . . That one word is **Kelvinator**

Simple... Reliable... Widely Adaptable...



WESTON

Electrical Tachometers

IMPROVE OPERATIONS AND CUT COSTS IN MANY WAYS

More and more industry is adopting WESTON Electrical Tachometers because this simple, electrical method of rotational speed indication cuts maintenance costs, provides higher accuracy over long periods, and makes possible new methods for increasing plant and machine efficiency.

WESTON Electrical Tachometers consist of but two units . . . a small, sturdy magneto which is driven by the rotating part, and one or more indicators which are calibrated to meet the requirements and wired to the magneto. There are no flexible shafts or other troublesome parts used. Thus installation is quick and simple . . . maintenance reduced to a negligible item . . . and high accuracy maintained over long periods even where vibration is present.

And with WESTON Tachometers, multiple indication, or remote indication is possible. Two, three, or any number of indicators can be connected to the magneto and placed wherever desired. Thus it is practical to maintain close supervision over the speed of fans, conveyors or other machines from remote points where necessary.

Complete data on WESTON Electrical Tachometers, and the many uses for this proved device, is freely offered . . . Weston Electrical Instrument Corporation, 577 Frelinghuysen Avenue, Newark, New Jersey.

WESTON *Instruments*

PACIFIC COAST REPRESENTATIVES

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263 Colman Bldg.
Seattle, Wash.

C. F. Henderson,
420 Market St.
San Francisco, Calif.

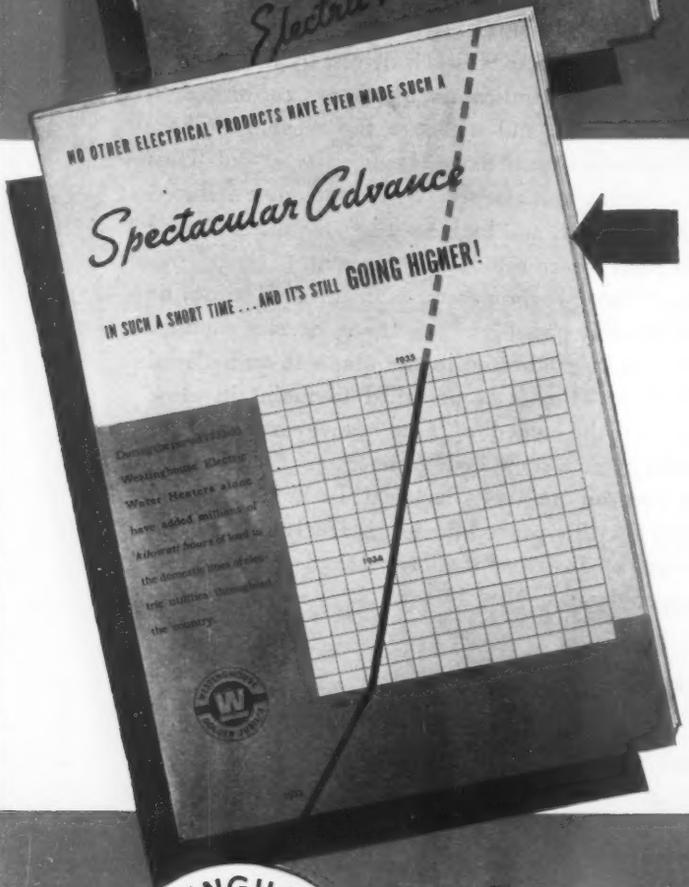
A. A. Barbera,
Subway Terminal Bldg.
Los Angeles, Calif.

PRINT IN BINDING

This book WILL OPEN YOUR EYES

to a new

SALES-MAKING, HISTORY-MAKING *opportunity*


NO OTHER ELECTRICAL PRODUCTS HAVE EVER MADE SUCH A
Spectacular Advance
IN SUCH A SHORT TIME . . . AND IT'S STILL GOING HIGHER!
1935
1936

YOUR SALES WILL CLIMB WITH THIS WINNE

You can share this spectacular Westinghouse sales advan the talk of the industry. Forget all old ideas about wat heaters and water heater selling. As a live *merchandis* you will recognize immediately in this 36-page book t reasons for the pyramiding sales of Westinghouse Wat Heaters. For here is a service millions of American wom need and want . . . heaters that reach a new peak of beau and enduring service-free quality among household applian . . . backed by sales plans and materials that are maki the electric water heater PROFIT *MERCHANDISE*, inste of a "pioneered" product. Get the facts. See for yours

WESTINGHOUSE 1886 1936 GOLDEN JUBILEE

Westinghous

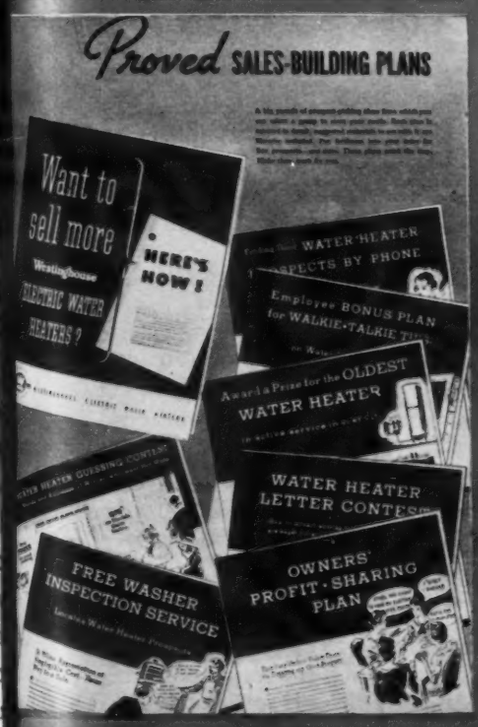
NEVER BEFORE SUCH POWERFUL SALES HELP FOR YOU

. . . FOR YOUR *Salesmen*

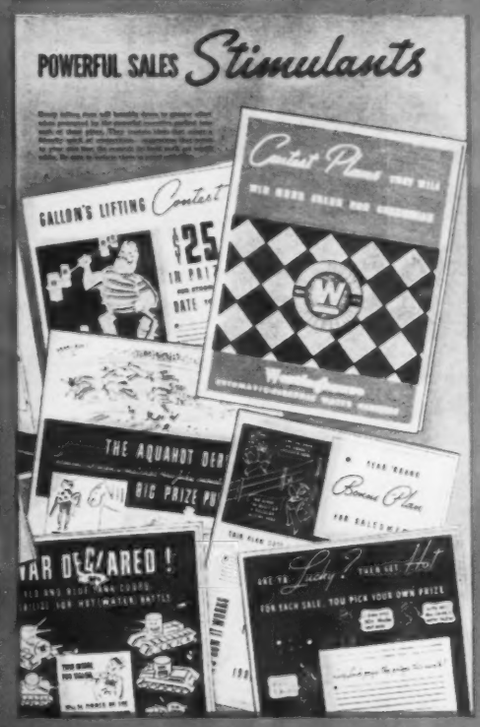
. . . . FOR YOUR *Store*

FOR YOUR LOCAL *Advertising*

Proved SALES-BUILDING PLANS


Want to sell more Westinghouse ELECTRIC WATER HEATERS?
HERE'S HOW!
WATER HEATER INSPECTS BY PHONE
Employee BONUS PLAN for WALKIE-TALKIE
Award a Prize for the OLDEST WATER HEATER
WATER HEATER LETTER CONTEST
FREE WASHER INSPECTION SERVICE
OWNERS' PROFIT-SHARING PLAN

Complete CONSUMER LITERATURE

POWERFUL SALES *Stimulants*

COUPON BRINGS YOU COMPLETE FACTS . . .

about new water heater *beauty*, new heights of *economy*, enduring *quality* . . . and sales plans that will help *YOU* crash the market.

Golden Jubilee
ELECTRIC WATER HEATERS

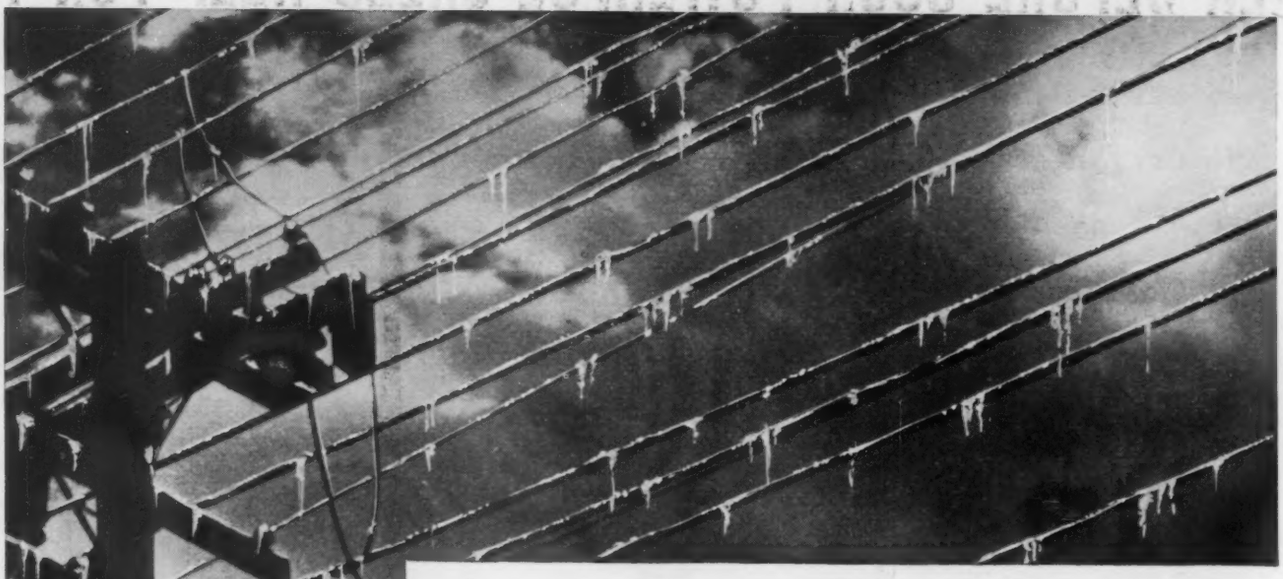
Westinghouse Electric & Mfg. Co., Mansfield, Ohio.

I want to see the book, and your complete plans that make electric water heaters a "merchandising" *profit* opportunity.

Company .....

Attention of ..... (Title)

Address .....



BRR-R-R! TOUGH WEATHER!

for *men and wires!*

WHETHER it's freezing . . . or scorching . . . it takes courage to send out these men to see that *service goes on!* Weather never stops them . . . but, you can't afford exhausted manpower. And so, why don't you help them by using the service of Reliance U. R. C. Weatherproof Wires.

You can save yourself many a hectic hour of worry and despair by the use of the proper wires and cables that can stand any sort of weather and temperature. Again we suggest Reliance U. R. C. Weatherproof Wires and Cables . . . their complete saturation with high melting point compound insures long life . . . despite the ravages of exposure and overloading.

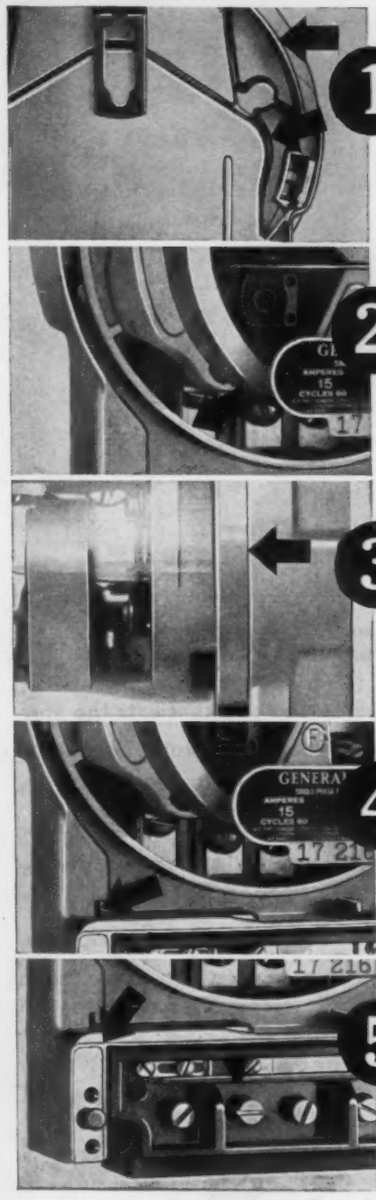
Only recently, research has brought to light some of the "hidden values" of Reliance quality. These wires and cables meet every requirement —satisfy every expectation.

COLUMBIA STEEL COMPANY
Pacific Coast Distributors for American Steel & Wire Company
Offices and Warehouses:
San Francisco, Los Angeles, Portland, Salt Lake City, Seattle

UNITED STATES STEEL

7 NEW FEATURES *of the* I-20 Meter Line

TYPE I-20-A



1. Double-walled meter base, which extends out around the base of the glass cover. It makes energy diversion more difficult.

2. Greater gasket-bearing surface, which improves the seal between the glass cover and the base.

3. Increased height of flange which overlaps the cover rings around the outside of the base. This makes the glass-cover-base seal more weather-resisting.

4. Drain hole on the upper side of the terminal chamber, which prevents accumulation of water.

5. Added beads on the cover flange around the terminal chamber, which improve the seal between the connection-box cover and the terminal chamber.

THE Type I-20-A is the General Electric bottom-connected, single-phase watthour meter. To provide additional protection, five improvements in details have recently been made. These are illustrated and described at the left.

Improvements have also been made in the Type I-20-S, which is the General Electric socket-type, single-phase watthour meter. These new features provide greater convenience and additional insulation. They are shown below.

In addition to watthour meters and accessories General Electric is now in a position to furnish tamperproof service cable, in three designs, and such fittings as straps, supports, and hooks.

Detailed information on watthour meters is given in Bulletin GEA-1898, and on service cable in GEA-1791. For copies address the nearest G-E office or General Electric Company, Dept. 6C-201, Schenectady, N. Y.

TYPE I-20-S

6. A hanger at the top of the base-plate assembly, which can be used to store meters on test-department racks, and which can be swung down into a recess in the base when the meter is placed in service.

7. A new base-plate assembly, which consists of a Textolite terminal plate riveted to a skeleton metal baseplate with a cork gasket between them. It improves the dielectric and mechanical strength.

400-16X

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The Allis-Chalmers Mfg. Co. builds standard motors of every type from 1 h. p. up, and special motors to meet every requirement. Write for further information.

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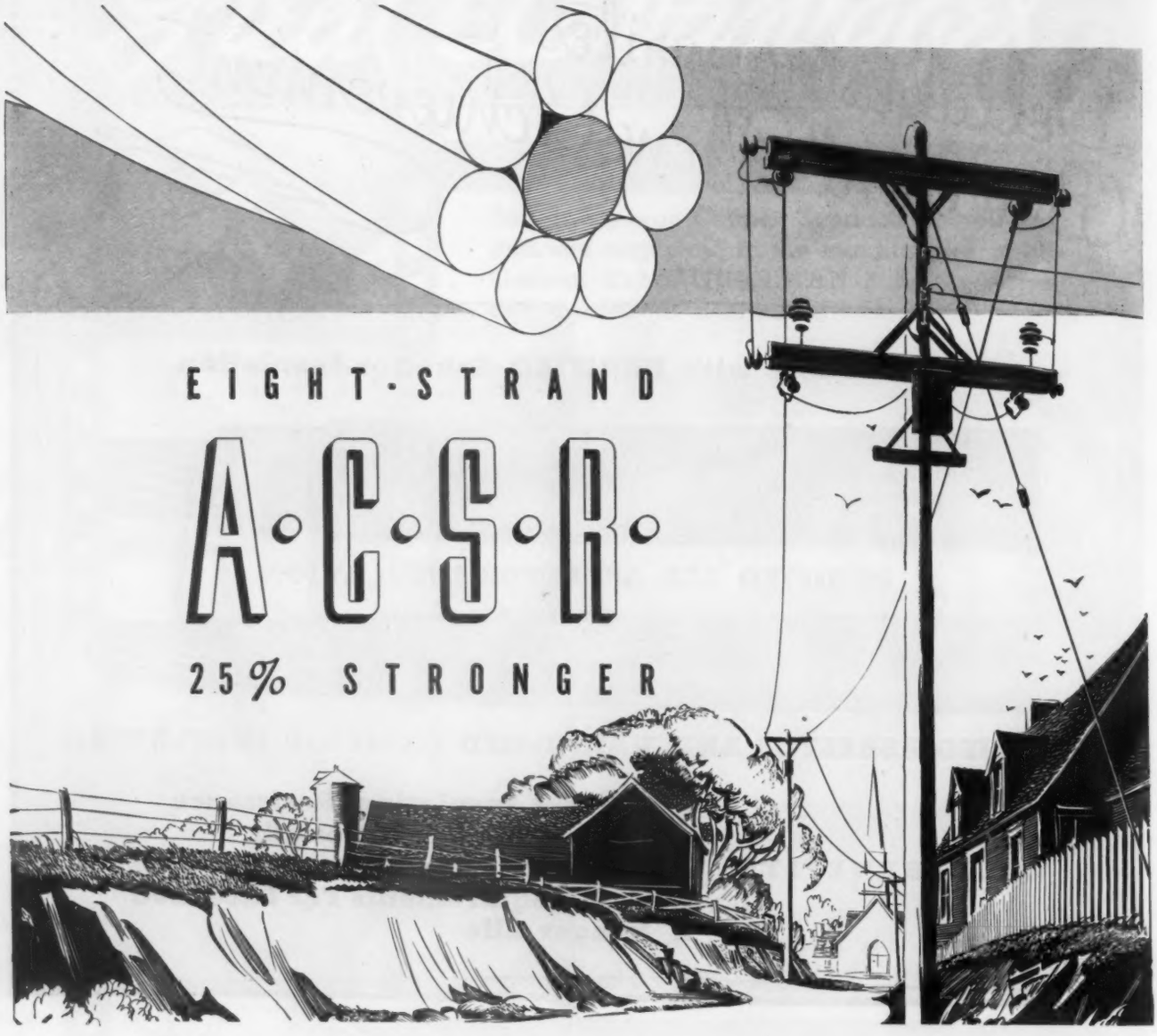

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CALIFORNIA'S *Electrical Age* HAS JUST BEGUN!

Class 8536 Type H 32 A. C. automatic starter. Enclosure is compact, unobtrusive; knockouts located on all sides and back. Note toggle type operating lever.

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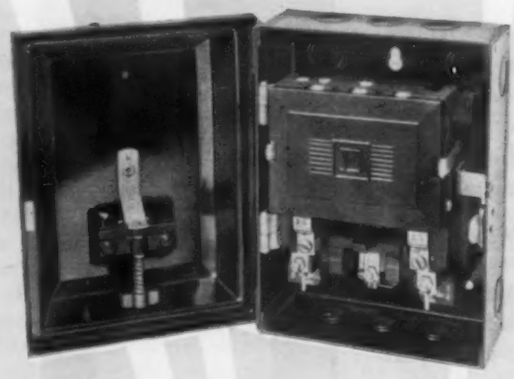
of the new CLASS 8536 TYPE H 32 A. C. STARTER

You are invited to preview a new Square D achievement in motor control—the Class 8536 Type H 32 A.C. automatic starter. Its design is a tribute to practical utility; its performance is a triumph in electrical efficiency. Inspection of this starter will reveal the complete accessibility of each and every one of its parts, as well as the ease with which it may be installed and wired; the simplicity of its maintenance, therefore, will be readily apparent.

Square D men can assure you of its performance, of its long life and of its positive control by pointing out to you the many practical refinements in its engineering design.

This new Square D starter is the non-reversing, across-the-line type, with low voltage release and adjustable thermostatic overload protection; maximum capacity,—5 HP, 220 volts or 7½ HP, 440-550 volts, 2 or 3 phase.



Open view showing molded arc resistant contact base and shield. Note absence of control wires between interior and cover.

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MATCHING every prediction for a record-breaking range year, General Electric offers a great new line of 1936 ranges that bids fair to break all sales records!

New beauty, new styling, new speeds, new economy! G-E Hi-Speed CALROD Units! *Everything* your prospects want . . . everything *you* need to do a big range business.

1936 features include new 6-quart smooth top Thrift Cooker with reversible wire rack . . . new high visibility switch buttons with color unit identification . . . new, easily removable pilot light with choice of colored shields . . . new radio-dial type automatic temperature control . . . and many others.

New, hard-hitting sales campaigns are ready to help you obtain volume business, fast turnover, greater net profits. See your G-E appliance distributor *now* for complete details. General Electric Company, Appliance and Merchandise Department, Section RC3, Nela Park, Cleveland, Ohio.

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ELECTRICAL WEST

[*Devoted to the economic production, transmission and distribution of electric power and its application to industry, commerce and the home in the Pacific Empire, and to the sale and distribution of electrical utilization devices, equipment and appliances in that area*]

March 1936

If It Is A Good Idea

By HARRY HARPER
Pacific District Manager, Graybar Electric Company, Inc., Los Angeles

WHAT perversity of human nature is it in us that magnifies a detail until often we lose sight of the main objective? This is a situation that occurs to all of us. Yet if the main objective is worth while, certainly it is to the best interest of all of us in this industry to take another look at the objective—this time unobstructed by any immediate detail.

What I am attempting to say is that our industry is the reverse of many. You and I might decide to engage in the manufacture of mouse traps. If we did we would find a market already obtaining. We wouldn't have to go out and develop the mice.

In our industry we do have to develop the "mice"—the "electric result producers" without which our whole industry has no reason for being.

As I write this I look up at the ceiling fixture in my office. That is an electric result producer. It produces light. Nor does it take much imagination to see in the ceiling an outlet box, lock nuts, bushings, wire, tape; and then the conduit running over to a panelboard which connects up with the conduit running down to the main switchboard, and from that point through a meter I see the load running out to the pole, where I find crossarms, insulators, wire, pole line hardware, transformers. Then there is a 2,300-volt line running somewhere back to a substation, which connects up with the switching station on the big transmission line back to the generating plant, whether it be of water power or steam.

The big idea is simply this: In our industry, before anyone participates in business, we have to provide the "mice." They are the "electric result producers."

Now an electric result producer may be a refrigerator, a washing machine, electric range, electric heater, a water heater, motor, an industrial heating application, in fact, anything through which electricity operates in the way of performing the ultimate result—*service.*

Sidetracked by a Detail

Back in 1932 a committee of us developed this idea quite thoroughly and published it as a booklet under the auspices of the Pacific Coast Electrical Bureau. The title of the booklet was "The Ideal Electric Home." In it was pointed out that "everyone's self-interest" was to be promoted by the active participation of everyone in the electrical industry in furthering the use and sale of all kinds of result producers. That idea is still good. The principle involved still holds true.

Unfortunately, the detail—electric heating—caused such a discussion, that the major idea was dimmed in the fog of that discussion. It has always seemed to me that with so much fireworks centered about the electric heating phase of the booklet the main feature, the basic idea was obscured.

Yet it still holds true that everyone in the industry has a self-interest in breeding "mice"—the *result producers* which use the electricity and bring to the customer the benefits of an otherwise intangible force. We cannot sell any "mouse traps" if this is not done.

As far as electric heat was concerned it offered such a big possibility that it was dealt with at considerable length for two reasons. First, its tremendous possibilities were explored and outlined. Second, we hoped to have the booklet serve as a sort of text for the industry in order to avoid improper installations.

Everyone is familiar with the black eye that electric ranges received when they first started. We haven't overcome all of these objections yet. Many people think they cost so much to operate that they are not practical. Others believe them to be slow.

The thinking of the committee was that if we could get electric heat off to a right start we would not be faced later with a similar problem. That being the case we did not want to see the industry apply electric heat where it was not practical. In other words, we wished to avoid seeing electric heating jobs installed in barns.

Likewise, we felt that a job should be installed with thermostatic control. Anyone who takes the trouble to investigate will find that tests prove savings of as much as 45 to 50 per cent in the heating cost where thermostatic control is installed. The booklet was conservative and promised at least 25 per cent. Our committee deemed it practical only to include a statement which could be fulfilled in all cases. In this respect the booklet formed a text on electric heating designed in such a way that the industry would not go off on a wrong tangent.

But suppose we leave electric heating out. The possibilities of the Red Seal home, fully equipped with appliances, is a story within itself. We demonstrated that a Red Seal home completely equipped with appliances would bring a consumption of 6,749 kw.-hr. per year. This was set up showing electric heat as a separate item. Why did we do that? So as to point out the advantages of the home completely electrified with everything other than electric heat. Compare the 6,749 kw.-hr. with an average of 714 kw.-hr. in California at the time the booklet was written.

Advantages of the various electrical

result producers were also graphically set forth. This was to aid salesmen in dramatizing the story of what these would do for the customer.

Permit me, however, to drive home the thought contained in that short phrase "everyone's self-interest."

Installation was made for the new Beverly Hills City Hall recently. Original specifications included a steam heating installation. In conjunction with our manufacturer our company went after electric heat. The heaters themselves amounted to $4,800 and the other equipment involved amounted to $5,000.

As I recall now the contractor's price on the job was between $14,000 and $15,000.

If we had not gone in and sold the idea of heating the building electrically the electrical industry would not have obtained any of this *plus* business.

As it was, we sold $4,800 worth of heaters and the various manufacturers got the sale of more conduit, rubber covered wire, switchboards, panelboards and other business. The Southern California Edison Co. received a profitable load.

Conduit Mouse Traps

Does the conduit manufacturer have an interest in the sale of electric result producers? Let us say that one of the conduit manufacturers was in touch with the architect in connection with the electrical wiring. Why shouldn't he have gone after the complete electrification of that job? He could have opened up the subject with the architect and others involved, and then put someone in touch with the electric heating phase of the job who could put it over. He could have listed such an inquiry with the power company, the manufacturers or the wholesalers who may be promoting such lines.

Here is a fundamental: The conduit people could do advertising and sales promotion until the end of the world to sell conduit, but they wouldn't get any business until someone decided to erect a building or some other structure which required electric wiring. When someone has decided to put up a building, though, the conduit people can do a lot to sell the idea of having more conduit go into that building by doing everything possible to completely electrify it. The same is true with anyone else who has anything to offer for electrical installation.

We have facing us great opportunities throughout the West. Great surpluses of electrical energy are soon to be turned into these markets to be sold. Without the sale of the "electric result producers" this surplus power cannot be absorbed. The industry, in all of its branches, is going to enjoy business in proportion to which the electric result producers are sold. Without them there will be no use for the wire, power plants, or anything else.

What does the customer care what is back of his lighting unit, his motor, or any of the other electrical devices? All that he is interested in is the result which such commodities bring to him.

Yes, indeed, the idea is definitely worth repeating and emphasizing. Everyone's self-interest is intimately related to the sale and promotion of the use of *electric result producers.* In such a program the complete Ideal Electric Home is a very important factor. We can all begin first by making our own homes electric, then helping our neighbors to electrify their homes, and thus spread the idea of using and buying electric result producers, which will give the customer enjoyment, convenience and leisure—and ourselves sales, profits, and volume in all of the facilities, fittings and devices between the power plant and the user.

•

Executives, Read This Letter!

ONCE in a blue moon out of the mass of business letters sent and received daily comes a gem of the letter-writing art. The attached letter appeals to me as one of these. It is so frankly revealing as to conditions, so refreshing in the philosophy it expresses, so vivid with pungency and humor that I felt it merited larger audience. I secured the sender's permission to submit it to Electrical West.—*Berkeley Snow, Executive Secretary, Northwest Electric Light & Power Assn.*

January 7, 1936.

Dear Mr. Snow:

Sorry to keep you waiting on this matter of dues, but please be advised that it has not been because I want to get out of my obligations. It is because every dollar is expended with considerable thought and it has been necessary to do this for the reason that my so-called salary is not enough for the living expenses, clothes, care of teeth, eyes and other necessary expenses for a family of six.

I happen unfortunately to belong to the skim-milk department of a power company and, if my information is correct, we in the commercial end of nearly all power companies, and especially the rural town departments, are more or less alike in that we are expected to go out and get the business; adjust or settle complaints; try and line up our customers to vote right and write or telegraph their congressmen or senators when adverse legislation is in the air; read meters, collect bills; climb poles when the weather is bad or the regular linemen are enjoying a holiday or Sunday; keep the office open 9 hours and report 8 hours on our time slips; get out after supper ("Dinner" if you have a real salary and play Golf) and sell load building devices for an hour or so—"extra money if *you make* quota"; take an active part in civic affairs, local commercial clubs and social and fraternal bodies that you might be useful to your company when said company is under attack.

However, let's be fair and say that I have not been able to keep up the expense of my lodge affiliations since I went to work for the power company. Also what activities I have engaged in as a citizen, endeavoring to make a better community in which to live and bring up my family, was for the purpose of securing a better environment for my children and those of the neighbors. While I have gone to bat a great many times for the company, it was because a man who is worth his salt will defend that which is his. The power company has been my company, and I have a greater respect for my job as a public servant and as a useful one to the community than as a servant of the stockholder or of the personnel of the management, with whom I have had many pleasant relations in the past 18 years. In other words, it is the pride in serving a necessary utility that betters living conditions for your community. Even though I should quit this sort of work and go to farming, I would still feel as strongly that the utilities should not be subjected to unjust laws, for the health and well being of these companies must be considered if adequate service is to be received by the communities dependent upon this kind of power. *Therefore I served.*

However, all this verbiage is to acquaint you that membership in your organization is not of much help to men who cannot afford to attend and get something out of it. $135.00 won't do it. Today we are members; tomorrow we may be digging ditches under relief—if so, I'll try and do a good job—or possibly we will be trapping muskrats.

Today I went in and asked the "Boss" for a raise or to restore the $15.00 which we lost two years ago. Will I get it? $150.00 a month! I fear I shocked the good man—God rest his soul!

I intended to attach a $1.00 bill to this letter, but my daughter has just come back from a call at the eye specialist and tells me she must have her lenses changed before *going on* with her studies at the local high school and that Dr. ——— is having them sent out C.O.D. Also, the wife informs me that she must have glasses before she can sew any more; so that means the eye specialists get some more business.

However, I'll send it in as soon as I can spare it. I find I, as a committeeman, owe the Boy Scouts two bucks that also should be paid this month. But I surely get my money out of that movement, even though my own boys are all girls, and I get a bigger kick out of one of their meetings than I would out of one of the President's dinner meetings. Of all the projects that we are tapped for "To help the Community", from Red Cross and Anti T. B. to the high school athletics, the boys organization is closest to my heart.

They are learning to be good citizens, sportsmen and gentlemen, and thanks to Mr. ——— (safety supervisor of the company) and the boys from our ———— power plant, they are learning and practicing first aid more thoroughly than it is usually given. Myself, I can do nothing, and the only one to benefit out of my presence is yours truly; but I sure get a kick out of it.

Jan. 14, 1936.

Well, I did not send or even finish this letter, but as the courtesy of an answer is due you, and more especially as you have had so much patience in this matter, I am going to send it today. You can fatten your wastebasket with it.

A dollar bill is enclosed.

Yours respectfully,

+ + + by Electra's Husband

Propaganda or Just Good Showmanship?

"DID you get 'more for your money than anywhere else in the world' like the nice man down at the City Light Department told us you would?" asked Electra after I got back from the regular two-day tour of the Skagit project of the city of Seattle.

"I haven't been everywhere else in the world," I answered. "But if you had gone with me as I suggested I would have got off cheaper than I did keeping you from starvation here at the Olympic in Seattle."

"And did you see a 'panorama of snow-capped peaks and glaciers of indescribable grandeur excelling the scenery of the Norwegian Fjords and the Swiss Alps' like the publicity booklet said?" she pursued.

"Tsk-tsk, Electra, what do you care? You've never been to Norway or Switzerland. I tell you the Skagit scenery would impress anyone. It impressed me as being a marvelous background for just about the neatest panorama of clever propaganda I ever saw."

"But I don't like propaganda," said Electra.

"Oh no? Then why do you buy Lux and Lifebuoy instead of something cheaper and probably just as good? But let me tell you about it anyway.

"You motor through Everett, Mt. Vernon, Sedro-Wooley and up the Skagit Valley to Rockport. Here, 110 miles from Seattle, you leave your car in the care of City Light watchmen, and receive an invitation to free coffee and doughnuts in a pretty little park by the station before the train leaves. The open car you travel on behind a gasoline locomotive from Rockport 23 miles to the Gorge Camp has hard seats and rides a none too even roadbed, but you're on an outing and you don't mind.

"On the way an affable City Light employee tears a section off your $2.50 ticket, and leaves you coupons for your return trip on the same train, for your meals at the Gorge Camp, and for your bed there. This last assigns you to a certain room in a certain building, but they evidently overflow the buildings on holidays because I found on my arrival at the Gorge Camp at 4:30 in the afternoon that my 'room' was one cot out of nine in a tent."

"But what would I have done at bed time?" asked Electra.

"Don't worry, my dear, you would have had your own cot in a similar tent in the women's quarters. J. D. Ross, the master-mind that designed this trip, knows he doesn't have to provide hotel accommodations for people spending $2.50 for a week-end on the Skagit. He provides mass camping de luxe, and although there were 600 people there over Labor Day with me, we all had our cots with mattress, blankets, pillow, sheets and towel all clean and neat.

"Supper is scheduled at 5 p. m., and you wonder with some misgiving what has happened to the cocktail hour. But the booklet tells you that liquor is prohibited at the Gorge Camp, and, though you resent the prohibition, you recognize the wisdom of it when you see all the youngsters there are running loose in the crowd. Supper and all the meals you get at the Gorge Camp are served in a large mess hall in bountiful construction camp style. The guy across from me that evening remarked that it was cheaper than living at home as he reached for his third half of fried chicken.

"After supper it is broad day light and you kill a little time strolling through a sylvan glade across the river. You get back in time for the motion pictures in the camp theater building."

"Ah-h-h," said Electra, "Clark for me and Marlene for you, I suppose."

"You're wrong there, old girl. Here's where subtlety is abandoned for a little direct selling. You get glaciers, snow fields, rushing rivers, and dam and power house construction telling the usual romantic (to the layman) story of man harnessing God's gift to the politicians. From the captions you learn that all this belongs to 'you'.

"After the pictures it is dark and the main show goes on at Gorge power plant, a 10-minute walk from camp. The grounds about the building have been pleasingly landscaped with lawn and shrubs, and lighted with 5-light post fixtures—old street lights from Seattle you are informed, if you evidence curiosity. The building itself is flood lighted in color with effect. Inside is the usual generating equipment—in this case two 30,000 and one 33,000-kva. generators, which operating on a 100-foot lower head than they were originally designed for, give the plant a total capacity of 57,500 kw., when there is sufficient water. At the far end of the generator room, placed so that you can't miss it, is a sign giving the amount of money earned for Seattle by the power plant up to the previous week from the kw.-hr. it has generated since 1924. The figure I saw was $40,155,554. The following day at the Diablo Dam upstream, as yet supplying no generating equipment, I looked for a sign calling attention to the interest this idle dam had cost the city of Seattle since it was completed in August 1930. And did I see one?"

"You did not," answered Electra. "I know the answers to most of your rhetorical questions. And I also know you well enough to bet you figured it out for yourself."

"I did, but it only came to about 2½ million, and in a municipal venture that's not worth worrying about. But the sign in the power house is the last bit of direct selling; the rest is consummate subtlety. When you leave the power house you follow one of the paths winding and switch-backing their way up a lighted hillside immediately adjacent. As you stroll up you note that among the native firs and shrubs that have been left wild are myriads of alien Alpines. You recognize some of the common varieties but the species of many elude you, unless perchance you are a student of such things. Evidently many parts of the world including the tropics are represented by their native varieties, and you learn from the 'literature' that these were donated to City Light.

"Suddenly you are conscious of birds singing, then music apparently emanating from some point in the woods above. This tends to heighten the fairyland-like illusion that has been creeping up on you, and, to give this illusion full play, you dismiss from your mind the obvious explanation that you are listening to a recording played in the

power house through a loud speaker installed in the woods. This music fades out as you swing over the crest of the ridge while from another source ahead comes a rich chorus of song recognized as an excellent recording of familiar church music. Then you see the lighted falls of Ladder Creek that your booklet described as a 'spectacle never to be forgotten'. The eerie effect of the changing spectrum playing on the three ladder-like steps of water falling some hundred or more feet, deeply recessed between moss-covered rocks, reminded one lady in the party of nothing so much as an illustration from Dante's Inferno, and this goes for me too."

"Are you going to claim familiarity with the classics and go poetic on me over a little artificial lighting?" asked Electra.

"Hush, my dear, you never saw such showmanship west of Broadway or north of Hollywood. That was the end of the evening's entertainment unless you count the dancing going on back in camp, which didn't look so good because of inadequate facilities for the large crowd and mediocre music.

"Going to bed you consult your schedule and find that the rising bell will sound at 6 a.m. and that this will give you 30 minutes for your matutinal ablutions. But does a raucous bell clang at six in the morning?"

"No!" pipes up Electra. "You are awakened by soft music coming over a loud speaker in your tent."

"You're right. But how do you know? And why are you stealing my lines?"

"Well, some of your climaxes are a bit obvious and I get tired of stooging for you all the time."

"Okeh. The train leaves for Reflector Bar at the base of Diablo Dam at 7:30, and this 7½-mile ride is made on an open flat car pulled by an electric engine along the steep granite cliffs through which the Skagit River flows. Fishermen speculate on what is swimming in the pools between the white water rapids, and power engineers cast an appraising eye at the probable second-foot flow and the drop."

"I know where your mind was," said Electra irrelevantly.

"Well, I didn't have my rod so I read the book and found the Skagit has varied over a period of years from 500 to 100,000 sec.-ft. with an annual mean of 4,000. It drops 400 feet between Diablo Dam and the Gorge power house but they're using only 270 feet since the permanent masonry dam originally included in the $5,000,000 estimate for this part of the project that cost $13,000,000 has never been built.

"Your train deposits you on a flat below the base of the Diablo Dam at the site of the unfinished power house and switching station. I thought they would show us the two 67,500-kva. generators planned for the initial installation here but they did not, though we could see the sheds down near the river where they have been stored since their purchase in 1931.

"Instead of parading this equipment in its long time dormant state they herd you direct to the funicular freight lift, which was designed to carry loaded freight cars up a stiff grade to the crest elevation of the dam 325 feet above the river. It has a capacity of 200 tons, and is powered with a 400-hp. motor, and it delivers your party of a hundred odd with ease to the next level of interest."

"That," interposed Electra, "must have appealed to you who can't climb upstairs without puffing like a porpoise."

"Right-o, and don't forget that J. D. has planned his tour so that anyone who can walk from the apartment to the corner grocery can make it with comfort.

"You are now at about El. 1200 and after a short walk you climb into one of the two open boats accommodating 50 or 60 for a trip to the head end of the lake above the dam. This lake is 6 miles long and about a half mile wide at its widest point, and lies among towering granite cliffs some of which rise to 8,000 feet or better, with glaciers and snow fields magnificently in evidence."

"Ah-h-h, the Alps," murmured Electra, probably wishing she had come along.

"Quite so. 'Stay near home and see the World' is Mr. Ross' slogan and it's not a bad one at that. Up at the head, which I swear I could approach across with a niblick, you are shown the site of the Ruby Dam to be, if, as and when. There on a cliff over 500 feet above your head is a white mark to indicate the crest elevation. This dam will impound 3,000,000 acre-feet of storage, completely regulate the flow of the river for the plants below, and supply 480,000 hp. of capacity at this site."

"Why all the statistics?" asked Electra. "I like your story better without them."

"I know. But some folks like facts."

"Well, they sound like fiction to me."

"Take them anyway you like, my dear, they're right out of Mr. Ross' annual book and they have been re-published from year to year now for a long time. Anyway that's the Skagit project as it is shown to you, except for a 1,180-ft. walk out along the arched crest of Diablo Dam to watch the water spill before you retrace your route to the Gorge Camp for lunch. You leave right after lunch by train for Rockport where you arrive at 3:30 finding your car intact as you left it, and are offered free lemonade and cake before the automobile trek back to Seattle."

"Well, what's the answer?" asked Electra.

"It's this. Excursions have left Seattle every Wednesday, Saturday and Sunday from April to November for the past several years, and thousands of Seattleites have gone. They have been made acquainted with the physical features of the Skagit project, and have had instilled into their minds that the project was indeed conceived in the Grand Manner and is to be executed in a Big Way—and that it belongs to them. They have been well and courteously cared for, have seen wonderful sights and have had a good time, and at so little cost as to feel, almost, that they have been house guests of the city. Actually they have paid the probable bare cost of the service rendered them. Thus they have been permitted to pay for and enjoy the privilege of selling themselves on their municipal power project. Now do you get it?"

"Sure," said Electra, "sales without sales expense! But why don't the private companies do something like this? They have power plants with just as picturesque settings!"

"Say, Electra, I've just fought traffic for 110 miles back from Rockport. Let's have a high-ball and go down to dinner."

Pump Testing Service Wins Support for Utility

By S. W. GREEN,
San Joaquin Light & Power Corp.,
Fresno, Calif.

Outbursts of power company criticism frequently are ducked, sidestepped or ignored, because nobody has the answer. A hotbed of antagonism recently was discovered in territory served by San Joaquin Power in Caruthers and vicinity during a survey to get reactions from the farmers regarding the formation of a power utility district, for which an election had been called.

Analysis of the criticism showed that no new development in power lines had taken place for years. The pride of new service and its value to the community long since had been forgotten. The contacts with residents of this community the power company had had in many months were mostly through meter readers, service men, monthly bills and an occasional shut-off notice. No friends of the company were present to defend it when the promoter of "cheaper" power showed up.

Because the average farmer knows little about load factors, pump efficiencies, and power company operation, the San Joaquin Power Sales Department saw a real opportunity to tell its story when announcement was made that a district fair would be held at Caruthers October 11-12. Space was taken and an exhibit prepared and installed under the direction of Norman Eichelberger, of the Sales Department, who also took charge of the interested inquirers.

The display had as a center of attraction a collection of worn-out pump runners, shafts, bearings and bowls, arranged to show the farmer how his water costs mount as his pump efficiency falls. Tieing in with the display were several charts and graphs giving facts about increasing water costs. Apparatus for making pump tests, and a power meter, completed the exhibit. The location was near exhibits of pump dealers who took advantage of the exhibit to show prospects the evils of inefficient pumps.

Mr. Eichelberger reported that he told his story to more than 200 individuals and groups, receiving 38 applications for pump tests, and interested several of the company's most severe critics.

Norman Eichelberger, Sales Dept. of the San Joaquin Light & Power Corp., showed the farmers why their water costs were increased due to worn out pumps at the company's exhibit at a district fair held at Caruthers, Calif.

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Willamette Valley Pumping Pays Dividends

By W. R. NEWMYER,
Agricultural Engineer,
Portland General Electric Co.,
Salem, Ore.

When the rate paid for electric power is as low as it is in the area of the Willamette Valley of Oregon, served by the Portland General Electric Co., irrigation from deep wells pays dividends. R. H. Clark, a dairyman on Route 6, Salem, Ore., is pumping about 200 gal. per min. from a depth of 51 ft. He is applying the water to 12 acres of Ladino clover pasture. This pasture will supply him with feed for a period of six to seven months per year for 36 cows at a power cost of about 45 cents per acre month or $5.40 for the 12 acres. By eliminating all barn feeding except about 1½ lbs. of grain for each cow per day, he is saving a feed bill of nearly $150 a month during the pasture season.

The increase in milk flow which occurred as soon as the cows were put on the pasture was 16 per cent or an increased return of $45 per month. The total cost of the well, pump, electric motor, and flume was about $1,200. Figuring an interest and depreciation charge of 12 per cent per year, each acre of the pasture should be charged with $12 per year or $2 an acre-month for the pasture season. A fair rental of the land would be $12 an acre per year or $2 per acre per pasture month.

Adding these items of 45 cents a month for power and 55 cents an acre for labor, we find the pasture cost him $5 per acre month or a total of $360 a year for the twelve acres. The saving in feed plus the value of the increased production equals $16.25 per acre month, a net return of $11.25 per acre month for the six months pasture season, or a total net return of $810 per year for the twelve acres.

If he would raise hay without irrigation on these twelve acres, he could sell the 30 tons he would raise for about $300 which would net him, after paying planting, cutting, baling, rental costs, about $6 per acre or $72 per year for the twelve acres.

Another example of the practicability of deep well irrigation is the farm of Albert Bouffleur, Route 3, Salem, Ore., who irrigates nine acres of Evergreen blackberries from a 170-ft. well,

The result of using such equipment is high water costs
Here are examples of what our Pump Tests uncovered in defective Pumps—
Good Pumps Save Money
You are invited to consult our Pump Testing Service

with an average lift of water being about 100 ft. He has two lines of pipe across the patch and from them irrigates by the furrow method. Mr. Bouffleur says that an average yearly return from his patch, without irrigation, would be about $120 per acre and with irrigation about $240.

His irrigation plant cost him about $3,000 on which a fair depreciation and interest charge would be $40 per acre year. His power cost for the 1935 season was $118.47 or $13 per acre.

His labor cost of applying the water is about $5 per acre for the season. The increased cost of picking and hauling the increased yield amounts to about $45, making a total cost per acre chargeable to irrigation of $103. The increased return minus the increased cost leaves him a net return of $17 per acre or about 14 per cent.

In many years the fact that he irrigates means a good crop instead of a total failure, so the above figures do not tell all of the story. Mr. Bouffleur intends to sprinkle instead of flood irrigate next year, as he believes he can get more benefit from the water with the sprinkling system. He can increase his acreage of blackberries, add some irrigated clover pasture, as he is planning, and sell water for irrigation to one of his neighbors, as his well and present equipment will handle several times the present acreage. If this is done, his interest and depreciation cost per acre will be materially reduced, with a consequent increase in the net return which he will receive due to the irrigation.

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Promoting Rural Load in British Columbia

FARMS throughout British Columbia have been the objective of the agricultural division of the British Columbia Electric Railway Company in special advertising campaigns.

The company has commenced a new series of farm lectures which are broadcast over the Canadian Radio Commission station at Vancouver and over the local CKWX station at Chilliwack, in the heart of the Fraser Valley area. This year a new innovation has been introduced in this connection, and these farm talks are being broadcast direct from the auditorium of the B. C. Electric at its New Westminster branch.

The general public are invited to be present at the auditorium and to hear the broadcast in person: then take part in a discussion hour which will follow each of the broadcasts. In order that the broadcasts may go on the air at 8 p.m., the public is requested to be seated at 7:55 p.m. The addresses in the series occupy fifteen minutes each, and are delivered by agricultural authorities from the University of British Columbia, the Provincial Department of Agriculture, and by practical farmers. In all cases the addresses are based on topical agricultural matters of interest to every farmer in the province.

The first group of talks in the series, for example, consisted of five lectures under the personal direction of Prof. H. M. King, head of the Department of Animal Husbandry at the University of British Columbia. He was assisted by various men prominent in the agricultural industry, the first speaker dealing with farm feeding problems in the Fraser Valley, and the second speaker, a well known stock raiser in the Sardis area, took as his subject "Hogs as a Side Line." As in previous years, the radio addresses this year will also be printed and will be available in booklet form to any who make application to the agricultural division of the company at Vancouver.

Another medium of promoting interest is an eight-page publication entitled "Farm Service News," issued monthly and circulated throughout the rural area of the company. A typical recent issue, for example, contained an illustrated article on the use of artificial light in making plants bloom on schedule. Another article, well illustrated, showed a motor coupled to a hay cutter, while yet another dealt with the electric operation of a one-ton feed mixer. Value of proper lighting within the home from a viewpoint of saving the eyesight of all members of the family was stressed in another article in this issue. Short items, recipes, and illustrations of new types of lamps and minor appliances handled by the company occupied the balance of the space.

As a third means of promoting interest, the company staged a very intensive display of agricultural appliances at the Canada Pacific Exhibition at Vancouver recently. This demonstrated practically every use of electricity on the farm, the display being made possible through the co-operation of agricultural and farm machinery manufacturers. One of the highlights of the display was the presence of half a dozen head of prize cattle in the booth, specially electrically equipped stalls being fitted up and demonstrations of electric milking being given daily. A reproduction of this display on a smaller scale was organized by the B. C. Electric and engaged in a tour of all the smaller fairs throughout the province.

In addition to this type of general promotion work, intensive individual efforts are being made by members of the company to direct the attention of live prospects in the district to the possibility of increasing the efficiency of their farms by use of electricity.

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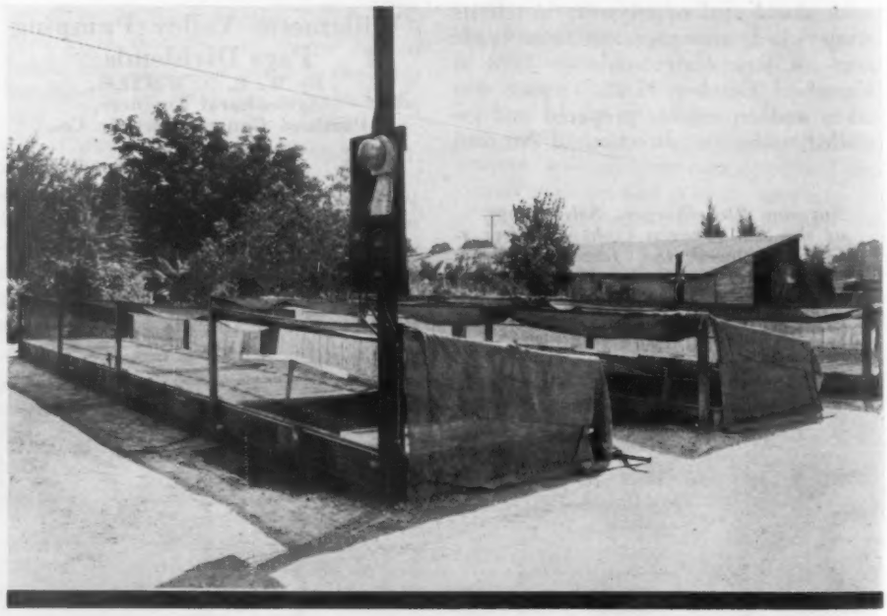
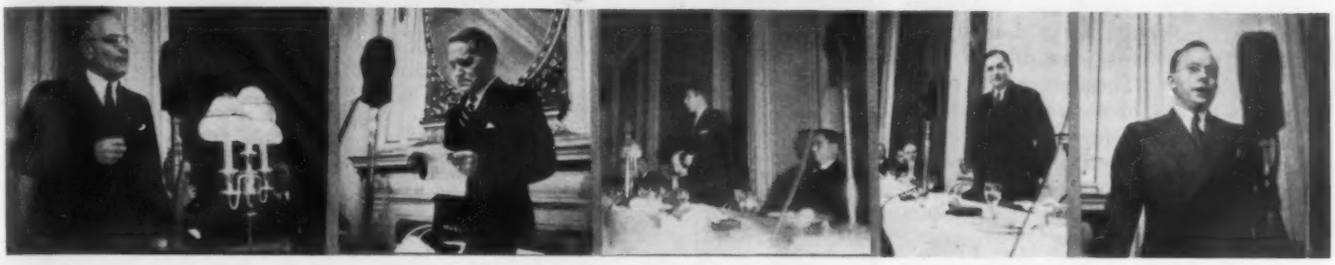
Commercial Soil Heating Increases



Commercial nurseries in southern California have been quick to adopt electric soil heating as a means of increasing and speeding production. This picture illustrates one of the latest types of installation. The frames, which are heated with soil heating cable, are used to germinate herbaceous plants, soft cuttings and roses. This nursery has made a great success of growing fine citrus trees in electrically heated germinating beds. Several such installations are on the lines of the Southern California Edison Co.

Cooperation on Parade + + +

[*Forecast of forthcoming cooperative merchandizing activities, and review of activities in progress or completed, a summary of cooperation at work throughout the West*]



Speakers at the appliance dinner, caught by the candid camera. Left: Lew Galbraith, who told of the romance in gas. Art Rowe, toastmaster. L. A. Clark, of Frigidaire, who told how to follow through on national advertising. Dr. G. W. Allison, who inspired with the possibilities of the modernized kitchen. Howard Blood, president of Norge, who visualized how obsolescence of appliances keeps the market always alive

Appliances Dominate

BIG market week in all respects, particularly in radio and appliance markets, the Western Furniture Exchange's Market Week, from Feb. 3 to 8, broke all records in attendance and in volume of business conducted.

Feature of the radio and appliance shows was the trade dinner Feb. 5 at the Palace Hotel. H. R. Basford, vice-president of the Exchange, and a pioneer in gas appliance merchandising, was chairman and Arthur E. Rowe, managing director, Pacific Radio Institute, was toastmaster for the dinner meeting.

Lew F. Galbraith, division sales manager, East Bay Division, Pacific Gas and Electric Co., was the first speaker telling of the romance and the possibilities in the gas appliance business.

L. A. Clark, advertising and sales promotion manager, household division of the Frigidaire Corp., Dayton, Ohio, talking on "Promoting the Sale of Electric Refrigerators," gave a number of excellent ideas for the follow-up of national advertising and promotional campaigns to bring sales to the local community. He urged the reading of national ads and the use of their wording in selling. He stressed the need of making displays *selling* displays, not merely exhibits; advocated auxiliary displays in other departments of the store with salesmen in charge and spot displays wherever possible.

He encouraged floor selling, supervision and planning and thorough demonstrations. Likewise, in outside selling a definite plan and close supervision were what brought results, he said. He advocated employee campaigns no matter how few employees a dealer had. Likewise, users are the best source of prospects for new purchases, he said. In seasonal campaigns he advocated not too frequent campaigning, and caution lest campaigns overlap or that they be conducted along too similar lines.

Howard E. Blood, president of the Norge Corp. of Detroit, speaking on "Looking Forward to 1936," pointed to several old appliances on the stage used in skits between the speeches. He drew attention to the fact that 5 or more

"Doc" Allison addressing the big market luncheon on Thursday. He was introduced by Al Meyer, a director in the Western Furniture Exchange and president of Leo J. Meyberg Co.

years ago each of these old appliances was the very latest thing of its day and something of which to be proud. He stressed by this point the rapidity of obsolescence and pointed out that homes and the equipment in homes is obsolete. So are the methods of heating, ironing, cooking and doing domestic work, he said. This makes a continuous market for the selling of better methods and equipment.

He also asked each one to check himself to see whether his own methods needed bringing up-to-date. Likewise, he said, it was very necessary to understand and know the product being sold, but more important to know what it would do for the woman in the home, in order to be able to visualize what it could add to her life by using it.

"Our job is to breed discontent with the old and the obsolete; to make the public understand vividly what the new appliances can mean in their homes. If they already knew we wouldn't need a sales organization. All we would need would be mail order methods and people would order without selling. We would all have to increase our plants to supply the demand," said Mr. Blood.

Dr. G. W. Allison, field director, Edison Electric Institute, closed the meeting with one of his usual inspirational messages. Beginning by pointing out what cooperation had accomplished in the refrigeration campaigns, the Better Light-Better Sight and even the running water campaigns, he dramatized the possibilities of the electric kitchen modernization movement now being undertaken by N.E.M.A. and E.E.I.

In stressing the possibilities of this modernization he pointed out that practically every kitchen in the country is a prospect, that it is a fundamental room in the home, that modernization and improvement has generally passed the kitchen, that two-thirds of the average woman's life, her waking hours, are spent in the kitchen, that there is the appeal of greater pride of ownership as well as a very tangible improvement in the real estate value of a house

in a modernized kitchen, that increased living standards are promoted, that health and economies in food are developed. There is even a safety message, he declared. Modernization should lessen accidents in one of the most hazardous rooms in the home.

Illustrating the acceptance of kitchen planning, he spoke of a locality in which kitchen plans were offered at a cost of a dollar. There were 524 plans requested and eight out of ten of those requesting plans bought at least one major kitchen device; 50 per cent of these were sold more than one major kitchen device as the result of the plan.

"Get a drawing in color, a picture of what her kitchen will look like when it is modernized, and deliver it yourself. Hang it up in the kitchen so that she can see it every time she goes into that room. Remember that she spends two-thirds of her time in there," said Dr. Allison in emphasizing how the modernization movement can be furthered by intelligent selling.

Entertainment of musical numbers and skits was provided by Arnold Maguire, of station KFRC.

A further feature of the market week was the address of Dr. Allison on Thursday noon to the entire Market audience. Again he told of the possibilities dormant in the modernization of the kitchen and how such improvement to the "workshop" would affect every other room in the home.

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Watsonville Dealer Wins Housewares Display Prize

Central Electric Co., Watsonville, Calif., won second prize and a $50 check in the National Electrical Housewares Week window display contest. The window was designed by Mrs. Stanovich, who has won a number of prize window contests by her clever displays.

Honorable mention prizes also were won by several Western dealers and utilities in the National Electrical Housewares Week window display contest conducted during the Christmas holidays. Among the dealer winners of honorable mention were Ernst Hardware Co., Seattle, Wash.; Electric Service & Supply Co., Aberdeen, Wash., F. L. Meredith, merchandise manager; Maxwell Hardware Co., of Berkeley, Calif., George Hauber, display manager; and L. F. Woodhead, Roswell, N. M. Utah Power & Light Co., Ogden, W. J. Brian, sales floor supervisor, was also a winner of an honorable mention prize.

Edison Electric Institute reports exceptional response to the national contest and plans similar campaigns during 1936.

New Electrical Palace Opens at San Diego Exposition

DEDICATED to the freer, healthier, happier living, the Palace of Electricity at California's 1936 Exposition will be a monument to past achievement in things electrical and an inspiration to future advancement. Devoted exclusively to the many phases of the electrical industry, the spacious building known as the Palace of Transportation during the 1935 Exposition is undergoing rapid renovation and readiness for a spectacular opening on March 7th. Credit and financial responsibility for making the electrical display a worthwhile reality must be divided between the Bureau of Radio and Electrical Appliances, the exposition management, and the San Diego Consolidated Gas & Electric Co. Administration rests with a committee of nine; four from the utility—A. E. Holloway, E. W. Meise, A. I. Benedict and F. M. Raymond; and four from the Bureau of Radio and Electrical Appliances—Harry Calloway, Frank Munro, Sam Hall and Ed Biunelle with J. Clark Chamberlain, executive secretary of the Bureau as directing head of the entire building.

Participation of electrical manufacturers is by invitation and on a conditional space-free basis. The principal condition to which each exhibitor has enthusiastically agreed calls for the demonstration and display of something unusual in the field of electrical science, something that will prompt "oh's and ah's" from every visitor.

Last year the exposition, while it employed electrical means for unusual lighting and spectacular effects, was considered by the industry as disappointing in the effort which the electrical industry made in its displays to the 5 million visitors to the fair. Taking the initiative, the San Diego Consolidated Gas & Electric Co. and the members of the electrical industry represented in the Bureau of Radio & Electrical Appliances are making an offer to the manufacturers and distributors which should result in a much more representative and worth-while exhibit in 1936.

The sponsors themselves will furnish floor space consistent with the needs of the exhibitor of the size of space without cost. They will also furnish uniform exhibit booths with backgrounds, walls and signs, electrical connections and outlets to each exhibit, all electrical energy needed for the operation of displays, heating service throughout the building, a complete new overhead illumination with perfect lighting conditions promised, liability insurance to protect exhibitors, use of lecture and demonstrating room and the advantage of a non-commercial lounge room and lighting demonstrations plus building supervision by non-commercial personnel employed by the sponsors.

Exhibitors, therefore, will need only to furnish the equipment to be displayed and personnel to handle the exhibits. Although the exposition opened Feb. 12, the electrical building will not open until March 1. Until June 1 a 7-hour day, 6 days a week was set by the exposition for exhibiting. Thus one person per exhibit, without relief, can handle the daily schedule from 1 p.m. to 8 p.m. From June 1 a summer schedule of a longer day will be put into effect and the closing date is set for Labor Day, Sept. 9.

In announcing this opportunity to the electrical industry, J. Clark Chamberlain, secretary-manager of the Bureau of Radio & Electrical Appliances, points out that the "Progress of Electricity" building should be the most popular on the grounds and should practically steal the show. Outdoor neon signs of unusual design will draw attention to the well located building. Indications from the advance sale of season tickets point to even larger attendance than during last year with a goal of 6,000,000 people.

At last reports the fullest response to this unusual opportunity for spectacular display of their products was being grasped with alacrity. In fact the committee in charge looked forward to some difficulty in accommodating all.

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"Two Radios" Will Be Theme of San Diego Drive

"Two radios for every home" will be the theme around which a novel promotion for radio will be built by the Bureau of Radio and Electrical Appliances of San Diego County during February and March. The object of the advertising and sales promotion will be to point out the real need for more than one radio in the average home.

It will be suggested that the present radio be reserved for the younger folks of the family and a new one acquired for the finest enjoyment of radio programs. The inconvenience or annoyance of having to forego favorite programs so that the children may listen to some of their favorites, or vice versa, will be dramatized in a series of radio broadcasts by the Bureau. A clever comedy team has prepared a script for radio broadcasts along this line which will be used twice each week, on Mondays and Thursdays.

Newspaper advertisements both in the city and the county papers will likewise feature this theme. A streetcar banner which will also be used as a window card will carry a cartoon of an elephant and a donkey with the inscription "You will need two radios this year." Dealers throughout San Diego County will tie-in window displays.

Refrigerator Prospects Face Choice of Gadgets

REFRIGERATOR prospects this year are in for a lot of argument. At least this is the impression which the editors received after viewing several of the sales shows and listening to the sales stories or reading the sales promotion literature of all of the refrigerator manufacturers in the launching of their 1936 programs. Indeed the battle will be over details of construction and operation unless manufacturers, distributors and dealers awaken to the realization that these in the long run are not what the customer needs or wants.

To make such an attack upon the market more absurd is the fact that practically every manufacturer has sought to meet each of the distinctive features or sales presentation of every other line by some improvement or imitation of a similar nature himself. The result is that never before have the gadgets and features been so nearly uniform for all makes of refrigerators.

F. C. Lyons dramatically displayed the advertising and sales helps designed to offer "proof vs. claims," for Frigidaire's 1936 drive for business

Each make has placed additional emphasis on modern styling and appearance, has broadened the curves or otherwise enhanced the appearance of the cabinet; nearly all have such convenient features as sliding shelves, food containers, water bottles, vegetable drawers or containers, interior lighting, etc. All have competitive models lower in price to meet the chain store competition. All claim a greater operating efficiency and lower operating cost. Nearly all give five-year guarantees of one sort or another. Many have adapted each other's type of mechanism and several have adopted or featured safer refrigerants.

Unfortunately, however, several have adopted a belligerent sales story which cannot but be good for the icemen.

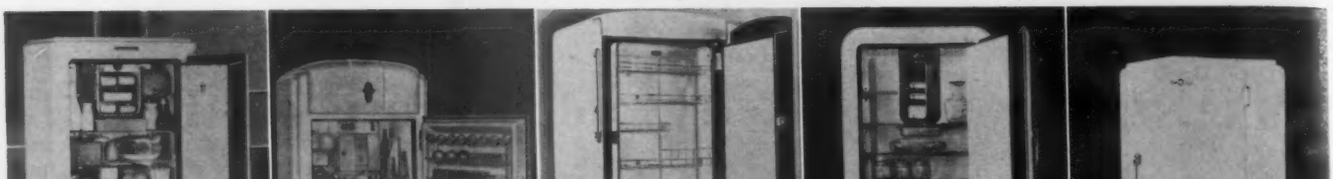
A review of the sales presentations and features of the 1936 lines will illustrate the trend just mentioned.

Frigidaire

Like Abou Ben Adam, Frigidaire continues to head the list when it comes to sales show presentation of its line. Skilled showmanship and well handled staging dramatizes every selling point. Lee Clark, manager, advertising and sales promotion department of the Household Division, headed up a crew which toured the Western region with the Frigidaire convention.

This show itself dramatized the state of confusion of a buyer of electric refrigeration in an opening skit depicting Mr. and Mrs. American Public in a fog of confusion over conflicting claims of various manufacturers. The theme of the sales convention, therefore, was set about Frigidaire methods for proving what it set about to establish as a set of "five standards of refrigeration value." These standards were listed by Frigidaire as: (1) Lower operating cost, which it hopes to prove by the use of a Sangamo meter and a display showing actual operating consumption of the refrigerator. (2) Safer food protection, which it hopes to prove by placing a small thermometer in the food compartment giving a visual temperature indication of maintained low temperature. (3) Fast freezing, plenty of ice, which it proves by means of a "thermo-gage" which registers the temperature in the freezing compartment. (4) Usability and convenience,

Lee Clark, ad man for Frigidaire, was master of ceremonies for the spectacular sales show



A representative array of new refrigerators offered buyers this year. Left to right: The new Westinghouse Jubilee model, with unit moved to the bottom. The Crosley de luxe, 7-ft. model with its new vegetable drawer in the base. Fairbanks-Morse, built like a safe, with double door and shelves on the inner door. Grunow's de luxe model with a flush front door. General Electric Co. new V-front flat top model

which the various features and gadgets provide. Incidentally, the new line has been made shallower and wider so as to make access to the interior of the refrigerator easier. (5) A five-year protection plan.

With the 1936 line Frigidaire uses a rolling type of compressor and coins a name for it, "Meter Miser." To outdo the "safe refrigerant" appeal it also introduces a new refrigerant known as F114 which was spectacularly demonstrated by A. C. Freiman who extinguished flames with it, drank it, breathed it, ate food dipped in it, washed in it, poured it over canary birds, flowers, colored silk and guinea pigs and even had goldfish swimming in it, ending up by throwing quantities of it over the audience. In fact, Frigidfaire seems to have anticipated every competitive claim and militantly is ready to meet it.

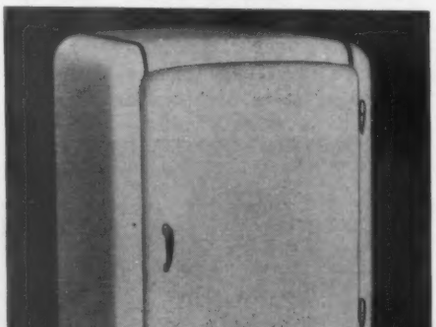
Particularly clever were skits presented to demonstrate the method of meeting competitive claims, the handling of commercial sales presentations and a dealer story illustrating the need for abandoning old-fashioned methods and developing aggressive modern salesmanship. A comedy skit "Fifty Words" illustrated the effectiveness of brevity rather than long windedness in sales talks. Excellent movies showing product construction, tests and advertising possibilities were employed. Spectacular effects were produced by a revolving stage and unusual lighting effects.

Kelvinator

Kelvinator seems to be the only refrigerator which has brought out a fundamentally new idea in its 1936 line. While air conditioned refrigerators had been pioneered by Potter, distribution of the latter has been limited and therefore this feature has not been generally publicized to the trade or the public.

In its "Super DeLuxe series" Kelvinator separates its freezing compartments from the food storage compartment completely and introduces a small electric-clock-motor-driven fan to circulate the air in the food compartment. The evaporator coils are protected by a baffle and condensation deposits in a long, narrow glass tray and is said to be reabsorbed in the air traveling through the compartment. A deororizer is also placed around the fan mechanism. In some models the freezing compartment is at the top in two sections, one for ice cubes and another for cold storage or larger ice cube freezing capacity.

The regular line all carries a small thermometer which is to be made the selling feature this year. The thermometer is built onto the freezer compartment although the bulb for it is said to be in the lower food compartment.



Norge made few changes, content that so many rivals copied its rollator compressor idea

The sales story on Kelvinator is to be built around the thermometer, a five-year protection plan, and a certificate of low cost of operation. Improvements in insulation, etc., are said to reduce the operating cost to a considerable extent.

Kelvinator, by the way, is to appear with a line of electric ranges later this year. Sales presentations were made to small groups of dealers by distributor salesmen. A sales training course is being offered dealers and salesmen.

Norge

Norge, likewise, held no sales show but did hold individual sales meetings with dealers, presented by the distributors. The entire Norge line, including the refrigerator, a washer, ironer and gas range, were featured in these showings. Coincident with such showings, dealers held a Norge National Show Week to display the new models of these appliances.

Norge brought out no fundamental changes in design or construction. Refinements in line and interior features are all that distinguished the 1936 models from those of the past. Possibly Norge is content that several competing lines of refrigerators have adopted the rolling type of compressor. Norge further distinguishes itself by refusing to offer a five year insurance plan as do many others.

It continues to have a special line with colored porcelain exterior to match its gas ranges. Although Norge also makes electric ranges, very little is being done with these at the present time. The washer and ironer have been improved in appearance, the ironer particularly with chromium plated steel tubing legs on casters. Introduction of an air conditioning unit which heats, cools and cleans the air is also being made. The heating unit is an outgrowth of the company's oil burner and is part of its hot water heating system. Cooling for summer can be arranged to use either ice, cold water or mechanical refrigeration.

Westinghouse

Westinghouse this year staged a more ambitious and better staged show than

during any of its previous presentations. Combining an afternoon presentation of the entire electric kitchen idea and in the evening the refrigeration program, the Western troupe was headed by J. D. Kelley, range manager of electric range sales, and P. Y. Danley, manager, domestic and commercial refrigeration sales, both from Mansfield. Added to the troupe were A. B. Murphy, sales promotion manager, San Francisco; R. M. Nichols, Jr., San Francisco; M. S. Henoch, and J. G. Miles, Jr., San Francisco.

Continuing its fan cooled, hermetically sealed units, the only change made this year has been to locate the unit in the base of the refrigerator rather than in the top. In redesigning cabinets a uniformity has been worked out so that refrigerator, water heater and range, as well as dish washer, will coordinate in the all-electric kitchen which will be stressed hard by Westinghouse.

The entire publicity and advertising theme of Westinghouse will center around the 50th anniversary or golden jubilee of the company.

Most spectacular improvements this year have been made to the Westinghouse range line. Designed to fit into the all-electric kitchen scheme each has several refinements over all previous models. Particularly interesting is the new Emperor, which has two ovens, one equipped with automatic time and temperature control, the other with automatic temperature control alone.

A new surface unit with a winding which gives a simmer heat instead of the usual medium heat offers reductions in cooking costs of about 18 to 24 per cent. It is pointed out that after surface cooking has been brought to the boiling point the low and the simmer positions are all that are necessary to continue the cooking operation. Thus the former medium heat is eliminated and in its place a simmer heat position substituted.

Another feature is the cooker pot and the two lamps over the cooking surface at the end of each of which is located the convenience outlet. A novel gadget is an electric cigarette lighter for the "matchless kitchen."

Promotion of the Westinghouse dish washer will come as a result of the kitchen modernization movement. An excellent moving picture has been prepared for the selling of the kitchen modernization idea, embracing all of the appliances that make up the kitchen.

General Electric

General Electric Co. this year held no general sales show. Meetings between distributors and dealers displayed the new lines and expounded the selling technique contemplated for this year. Few changes have been made in the General Electric models, although more emphasis is being placed on the flat top models from year to year. The Monitor top model is still being featured as the apex of the line. New style features have been added to both but very little except detail changes have been made to the equipment or gadgets.

More emphasis will be placed on the electric kitchen by General Electric Co., the pioneer in this movement. Tie-ins with the New American Home displays and a completely equipped and functioning kitchen planning service are already in operation.

Hotpoint refrigerators likewise embody refinements in detail of appearance with no fundamental changes in mechanism or appointments.

Fairbanks-Morse

Fairbanks-Morse have introduced a new line in addition to the line of models introduced last year. All models are equipped with a particular double door or "Conservador" feature. Claim is made that the shelf-lined inner door gives more usable storage space and cuts operating costs by eliminating the escape of cold air and preventing the inrush of warm air when only the outer door is opened.

Grunow

Grunow refrigerators will continue to stress its "safe refrigerant" and will bring out lower priced models as well. Demonstrations of the safety of Carrene will form a basic sales story with a new kit designed to be taken into the home to make a test before the prospect. Improvement in the mechanism is claimed, which is designed to give greater economy in current consumption and give simpler mechanism.

Sectional sales meetings with dealers throughout the United States have been held to introduce the new line and present its selling story.

Crosley

Crosley new models were introduced at a series of dealer meetings sponsored by the various distributors.

Always the leader in gadgets, Crosley this year introduces what it calls the "Stora-Drawer," an unrefrigerated drawer at the base of the refrigerator for the storage of potatoes, onions and other bulk items and reserve canned or bottled goods which otherwise would take up room in the kitchen. Its already shelf-lined door has been expanded to take care of a set of glass jars as well as for other food items such as eggs and fruit. Refinements in styling and other features have been added.

One interesting change is the introduction of a new hermetic type of refrigerating mechanism employing a reciprocating type of compressor with what is known as a "Scotch yoke" instead of a connecting rod. The hermetically sealed compressor unit is built in the shape of a dome and located in the top of the refrigerator.

Apex likewise comes out with a complete array of new gadgets in its 1936 line. It, too, has a separate storage compartment in the base for dry vegetables or other supplies not requiring refrigeration. A number of interior refinements in the way of lighting, shelves and racks, etc. are incorporated in the new models. An advertised feature is that both the fast freezing and defrosting return automatically to normal operation after the required time.

Stewart Warner

Stewart-Warner has "gone gadget" in a big way with a swinging two deck shelf arrangement just inside the door. This may be lifted out completely and carried to the table. Or again it can be snapped onto hangers on the door if preferred.

Novelty is introduced to the temperature control by the addition of airplane type dial and lighting of the dial. Also, instead of the usual positions the calibrations are in "winter" positions and "summer" positions. Another stunt is a sliding tray which comes out by pulling the panel at the base of the refrigerator.

Gibson

Gibson refrigerator announces an air conditioned model but details of it are lacking. Likewise its freezer shelf is continued in this year's models, together with convenience features similar to those of every make.

Summary

Altogether, then, with the gadget and equipment handicaps more even than ever before, each make promising greater efficiency and less operating cost, practically all offering long term guarantees, each with a choice of finishes and an enlarged list of models both of de-luxe and competitive lines, each with reductions in price, the battle for volume is very apt to be fought on the field of details, which will confuse customers and retard sales.

It would appear, then, that the time never called so urgently for a cooperative movement to sell the benefits of electric refrigeration and to endeavor to reach more prospects, rather than to confuse the few with competitive claims and mechanical details. Lower priced models should enable salesmen to penetrate a market of lower income, the replacement market is larger than ever before, and the potential of 175,000 refrigerators in the eleven Western states is ample enough to turn sales emphasis from confusing details to customer advantages so that all makes may sell the enlarged quotas of 1936.

Two Weeks of Gift Orders Boost Coast Counties Sales

EVEN two weeks' results from the extraordinary appliance certificate gift offer made by the Coast Counties Gas & Electric Co. to its domestic customers demonstrated that the prediction of H. W. Edmund, sales manager, would more than be fulfilled. "We believe that alert dealers will take our certificates as down payments on any electric device," he said in making the offer and predicted that the amount of the certificates would easily be tripled in dealer sales.

Results at the end of two weeks showed a total number of appliance sales of 3,994 with a total value of $21,628.45. The number of certificates cashed was 3,985, whose face value totaled $6,910.74. Thus the ratio of value of sales to face value of certificates was already better than 3 to 1. A total of 17,000 domestic customers were issued the certificates, whose total face value was about $25,000.

The plan operated by giving domestic customers with the January billing a merchandise certificate equal in purchasing value to one-half of the charge for electricity for the month of January. This certificate could be used as a merchandise order on any cooperating electrical dealer to apply on the purchase of any electrical appliance or even Mazda lamps. The order was to be used during the month of February only. Dealers then cashed the certificates at the local office of the company at face value, less 10 per cent.

At the end of the first two weeks an interesting and significant list of sales was reported. Mazda lamps naturally absorbed the largest proportion of the certificates. There were 2,162 certificates used in the purchase of 12,972 Mazda lamps. Next largest item were the floor, table and I.E.S. lamps totaling 482 sales. Following closely came toasters with 460 sales. Certificates were also used in the purchase of one range, two water heaters, one refrigerator, 64 portable air heaters, 24 washing machines, two ironers, 17 cooker ovens, 91 grills and hotplates, 129 waffle irons, 201 irons, 23 radios, 53 percolators, 40 coffee makers, 29 mixers, 112 electric clocks, 82 heating pads, 18 vacuum cleaners, 2 floor polishers, 1 sun lamp, 18 heat lamps and 10 vibrators.

Increased public goodwill at receiving such a bonus in a very tangible sum, all at once rather than spread over the year in driblets as a rate reduction, and increased dealer goodwill because of the number of sales which the program stimulated and set into action, have resulted from this unusual experiment. Manufacturers, such as General Electric Co., aided dealers to capitalize on the opportunity by assistance in large full page ads in daily papers.

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•"LOS ANGELES ELECTRICAL NEWS,"—the first issue of the enlarged sales pamphlet formerly called the *Electric Ranger*, has appeared with the February number. It is published by the Los Angeles Bureau of Power and Light and its circulation has been increased from that merely of electric range salesmen, dealers and distributors to include other interested persons in both the electrical and the architectural industries. News of new electrical installations, developments, appliances are also run.

DEALER SALES REPORTS—JANUARY 1936

A Summary of Dealer Reports Compiled by Associations, Societies, or Bureaus, or Dealer Contact Departments of Utilities

APPLIANCE	P. G. & E. Co.[1]		San Diego Cons. G. & E. Co.[2]		San Joaquin Lt. & P. Corp.[3]		So. Calif. Edison Co., Ltd.[4]		Utah Power & Lt. Co.[5]		Wash. Water Power Co.[6]		Idaho Power Co.[7]	
	Jan. 1936	Year to date	Jan. 1936	Year to date	Jan. 1936	Year to date	Jan. 1936	Year to date	Jan. 1936	Year to date	Jan. 1936	Year to date	Jan. 1936	Year to date
Ranges	221	221	35	35	139	139	.....	.....	.....	.....	.....	.....	173	173
Water Heaters	176	176	50	50	86	86	.....	.....	.....	.....	.....	.....	.....	.....
Air Heaters—aux.	.....	.....	250	250	68	68	.....	.....	.....	.....	.....	.....	90	90
Air Heaters, 220	95	95	.....	.....	112	112	.....	.....	.....	.....	.....	.....	.....	.....
Refrigerators	.....	.....	350	350	172	172	.....	.....	.....	.....	.....	.....	194	194
Dishwashers	62	62	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washers	3,031	3,031	275	275	316	316	.....	.....	.....	.....	.....	.....	641	641
Ironers	1,076	1,076	65	65	73	73	.....	.....	.....	.....	.....	.....	114	114
Vac. Cleaners	2,349	2,349	150	150	62	62	.....	.....	.....	.....	.....	.....	146	146
Radios	13,344	13,344	1,000	1,000	609	609	.....	.....	.....	.....	.....	.....	966	966
Mixers	3,541	3,541	100	100	86	86	.....	.....	.....	.....	.....	.....	122	122
Cookers, Casseroles	.....	.....	50	50	17	17	.....	.....	.....	.....	.....	.....	.....	.....
Irons	.....	.....	350	350	286	286	.....	.....	.....	.....	.....	.....	370	370
Waffle Irons	.....	.....	225	225	138	138	.....	.....	.....	.....	.....	.....	195	195
Toasters	.....	.....	150	150	187	187	.....	.....	.....	.....	.....	.....	196	196
Table Stoves, etc.	.....	.....	50	50	175	175	.....	.....	.....	.....	.....	.....	206	206
Heating Pads	.....	.....	250	250	32	32	.....	.....	.....	.....	.....	.....	91	91
Curling Irons	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coffee Makers	.....	.....	200	200	117	117	.....	.....	.....	.....	.....	.....	178	178
Sewing Machines	1,409	1,409	40	40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clocks	.....	.....	250	250	120	120	.....	.....	.....	.....	.....	.....	71	71
Fans	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14	14
Floor Polishers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sun Lamps	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	6
Reflector Lamps	.....	.....	.....	.....	106	106	.....	.....	.....	.....	.....	.....	692	692
Misc. Lamps	.....	.....	.....	.....	33	33	.....	.....	.....	.....	.....	.....	1,252	1,252
Yard Lights	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Misc. Small Appl.	.....	.....	.....	.....	202	202	.....	.....	.....	.....	.....	.....	.....	.....
Total Dealers	1,400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
No. Reporting	.....	.....	.....	.....	120	.....	.....	.....	.....	.....	.....	.....	.....	.....

[1] P. G. and E. reports obtained only on major appliances upon which accurate reports are available from dealers' accounts. Ranges, water heaters, and air heaters include company and dealer sales. Total dealers include gas as well as electric dealers. First report of year 1935 starts with Dec., 1934, and will be cumulative from that month.

[2] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table. Clocks, fans included under miscellaneous.

[3] Includes dealer reports from Midland Counties Public Service Corp. territory also. Compiled by Valley Electrical Supply Co.

[4] Includes reports from dealers on San Joaquin Valley system of the company as well as Southern California areas served. Comparative figures of same month last year indicates improvement.

[5] Includes Utah Power & Light Co. territory in Utah, Idaho and Wyoming. Also Western Colorado Power Co. territory. Dollar value of appliance sales in June, 1935, is over 300,000 ahead of sales in June, 1934.

[6] Dealer sales only for Spokane and company's territory. Company sales not included. Table stoves, grills included with cookers.

[7] Figures compiled by Electrical Equipment Sales Association. Include power company sales and sales of all reporting dealers—about 60% report.

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Vol. 3

ELECTRICAL WEST COOPERATIVE

SALES APPLIANCE ★ GUIDE

MARCH, 1936

. . . . Copyright, 1936, by Electrical West, 883 Mission St., San Francisco

There's Money in Electric Ranges

If You Use This Simplified "Check Chart" in YOUR Operations

YOU want to *make money* in ranges, naturally. Experience of smart and successful merchants has shown that in order to get volume, and hence profit, it is good practice to do the things suggested in these pages. So use this Guide as a "Check Chart" to make sure you haven't overlooked any bets that will mean *results* to you as dealer or salesman. *Save* this guide by clipping it from the magazine, keeping it in a binder or file ready for use every range campaign.

Stock

1. *Have enough stock on hand* for immediate deliveries.
2. *Have a model* or more for *floor display* and possibly demonstration. If you have an electric kitchen this can be used for demonstration of actual cookery.
3. *Have a feature range* for window display.
4. *Order display material* with ranges so as to have it ready for a campaign.

Service

1. *Have you arrangements* made for uncrating, inspecting and cleaning up new ranges on arrival? This is half the battle to prepare for clean looking, easy selling.
2. *Is your delivery service* instructed to treat the range on delivery with respect and care? A big factor in the satisfaction of a new user is HOW the "pretty new range" is delivered and set up. So check-up on uniforms, protective blankets, facilities to deliver the prized new range easily and cleanly.

Wiring

1. *Wiring arrangements* are more satisfactory to you and your customer if made in advance and with competent workmen who leave no muss. Pick a contractor who *BELIEVES* in electric cooking. A careless word while installing may bring lasting dissatisfaction. A booster will help your customer over the first days of adjustment to a new range.
2. *Find out about and use* any special wiring arrangements made available by your utility.

Salesmen

1. *Plan your calls.* Arrange your prospects so as to conserve your time and theirs.
2. *Decide on a procedure.* In other words know what you are going to say and do.
3. *Use your users* — that is, get leads from them for prospects. Make your call on a user do double duty; (1) make them feel good that you are still interested in them, (2) ask them to suggest friends who might be glad to enjoy the satisfaction they are having. You can also put in a good word for other appliances so that your customers will come back to *you* when they want electrical service or servants.

Learn a demonstration routine

Sales Talk

1. *Use the tested,* scientifically prepared and result-getting sales talk that Bill Smith, the Master Salesman, gives inside this Guide. Notice how it conforms to the sales principles outlined on page 4. Adjust it to your own language, but keep it *in the customer's interests* as Bill does.

Learn to Cook

Nothing sells you so thoroughly, and makes it easier for you to sell a range than to know how to cook on one easily and successfully. So arrange to learn how, either by asking your manufacturer to bring his home economist into town to give a class in cooking for his dealers and salesmen, or go over to the power company and ask its home economist to teach you. It will double your sales, because you'll be so much more convincing.

What Range Sales Mean to You

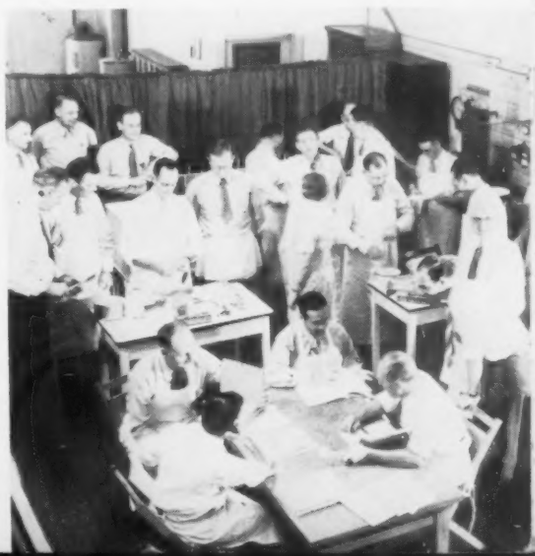
1. More of your gross profit from range sales stays with you, because after you have made delivery, the power company usually takes care of all service costs that would reduce your net profit.

2. An opportunity to build up a customer to a complete electric kitchen; even to a laundry and electric home.

3. An appliance on which both the manufacturer and utility carry the heavy load of advertising, promotion, and break down sales resistance for you.

4. A sale of sufficient importance that will make a lifelong customer and booster for you if handled right, because nothing is so intimately connected with a family's welfare as its food.

Manufacturer or utility often conduct dealer and salesmen's cooking classes. Take advantage of these. Not only fun, but profit, comes from "knowing your onions"



SALES TALKS THAT

CASE HISTORY NO. 15
Selling an ELECTRIC RANGE

WHENEVER, be it spring or fall, the industry lays plans for its annual electric range sales campaign, Bill Smith, the master salesman, always capitalizes upon the manufacturers' and the utility's sales promotional efforts by gearing his sales plans to them. This year he has prepared an attractive floor display which includes a number of models that retail for around $100 and is ready not only to develop his own range prospects into users but also to take full advantage of the prospects developed by local activities such as cooking schools, etc. His modest advertisement in the local papers is responsible for the following opportunity to sell a prospect that has come into his store. She is a young woman of the "casual shopper" type and it will be seen that she is difficult to sell because she feels that she hasn't sufficient money to buy. Doubtless the average salesman hits rough going like this in numerous instances and it is well worth while to see how Bill convinces the prospect to buy.

★ ★ ★

MRS. JAMES: "I saw your advertisement and dropped in to see the new electric ranges. At the Tribune's cooking school, which I have been attending, everyone seemed enthusiastic about electric cookery. Are these the new models you mentioned in the ad?"

BILL: "I am very glad you came in. Yes, these are our newest models. They incorporate all of the advantages of electric cookery that you have been hearing about and the modern new designs make them a handsome piece of furniture. May I ask what type of range you are using now?"

HERE Bill wants to find out more about his prospect's needs so that he will be able to plan his sales talk more effectively.

MRS. JAMES *(smiling)*: "Well to be truthful I've just been married a short time and my husband and I are planning to furnish our own home now. That's one reason I've been going to the cooking school to find out something about modern housekeeping."

BILL: "That's an excellent idea that I am sure every husband would appreciate. I'm glad to see that you are interested in electric cookery because it is the easy, modern way to cook and the close temperature control possible on one of these ranges practically guarantees uniform results from every recipe. Cakes, biscuits and roasts all come out perfectly when cooked in the even temperature of the electric oven. A range like this certainly will help to establish a reputation as a cook with your husband."

MRS. JAMES: "I can appreciate that from what was said at the cooking school and I would like to have one. How much does this one sell for?"

BILL: "These splendid new models are offered at surprisingly low prices. For instance, this model with the four high speed top units and the 20-in. oven and the automatic temperature control sells for only $....."

MRS. JAMES: "Frankly, we cannot afford to put that much in a range now. As I mentioned, we are furnishing the complete house and our budget for each room is quite limited. You see, we don't want to go too far in debt right at this time."

Sold APPLIANCES

THIS is a case where the prospect has been pretty well sold on the product but she really believes that she does not have enough money to purchase it. Getting this type of prospect to sign on the dotted line requires real salesmanship.

BILL: "I can appreciate that the complete furnishings of a home are quite expensive and that is why you should consider not only the first cost of the various pieces of furniture you will require but also the economies and comfort that are possible from making a wise selection. Let me explain further by taking this range as an example. It may require a slightly larger investment in the first place but it will save you money in many ways. These savings not only will soon pay for the slight additional cost but also permit you to enjoy the advantages and comfort of electric cooking from the first day you set up housekeeping. For instance, the first dividend you can expect from your electric range is the direct saving in food costs. As you probably learned at the cooking demonstrations, vitamin cookery possible on the electric range requires but little water and a small amount of heat. Thus you retain all of the nutritious elements of the food with a minimum cooking cost. Meats, cooked electrically, retain their natural juices, and hence do not shrink and the less expensive cuts come out of an electric oven tender and tasty. Thus your electric range enables you to save on your food and butcher bill."

MRS. JAMES: "I begin to see what you mean, but our problem is not so much the savings we can make, but the fact that we just have so much money to spend now and we can't spend it all on a few items when we need so many."

BILL: "You are very wise in that and I know that you want to make your home as comfortable and pleasant as possible. That is why I want you to understand just how an electric range can help you without sacrificing other conveniences. Remember that your range is used three times a day and you want one that will relieve you of as much of the burden of housework as possible. Electric cookery requires less attention during the preparation of the meals and will leave you more time to devote to other things. Furthermore, its absolute cleanliness minimizes the work of washing woodwork and curtains and gives your kitchen a spic and span appearance at all times. You owe it to yourself and your husband to take full advantage of every bit of leisure that modern electrical sciences like this range will bring you."

MRS. JAMES: "All of that may be true but I understand that using electricity for cooking is expensive. We are going to have to watch every cent if we ever expect to pay for all the furniture we are buying."

BILL: "I am glad you brought that point up because I had almost forgotten to mention one of the most important savings that the electric range makes possible. Here in this town we enjoy among the lowest cooking rates in the country and the important thing is that the low cooking rates apply not only to your range but to all the other uses you make of electricity to make your home more modern and more comfortable—and that means a great deal to the modern young housekeeper. Of course, I don't know what you are planning to buy for your new home but I can tell you this from my own experience that the money you spend on electrical appliances will be repaid many times over in health, comfort, convenience and leisure that you and your husband will enjoy. If you have this electric range in your home you need not worry about the operating costs of any other appliance because you get the same low rate for all of the energy you use. I have three or four bills here of customers who use electric cooking. You can see for yourself that it is extremely economical."

NOTICE that Bill keeps driving at the savings the prospect can make. You notice that he is also cleverly injecting the idea of other appliances on the low cost of their operation.

MRS. JAMES: "It does appear to be fairly reasonable, doesn't it? It's been very kind of you to explain all this to me and I certainly appreciate it but I don't quite see how we can afford an electric range right now, much as I would like to have one."

BILL *(sensing that his prospect is sold and needs only a good driving finish to eliminate the lingering first cost objection)*: "You are showing good judgment in trying to keep to your budget figures but I know that you will be sacrificing a great deal if you do not start using electric cookery right from the first. Just think, with the new electric ranges you get vitamin cookery, the assurance of a clean, cool kitchen, which is particularly important during the summer months that are coming, extra hours of leisure and relief from housework, and the direct savings in food costs which will soon pay for the difference in the cost between this beautiful model and the amount you had figured in your budget. If you are planning to use a budget plan of payment, which we could very easily arrange, I can assure you that you won't miss the few extra pennies that will put this handsome, modern electrical servant in your new home. If you start with the electric range you soon can have a modern all-electric home of which you and your husband can be justly proud."

MRS. JAMES: "Taking everything into consideration I believe you are right. I believe we will take one of these models if you are sure we can arrange suitable terms."

CALIFORNIA OREGON POWER CO. • PORTLAND GENERAL ELECTRIC CO.
MOUNTAIN STATES POWER CO. • PUGET SOUND POWER & LIGHT CO.
PACIFIC POWER & LIGHT CO. • IDAHO POWER CO.
NORTHWESTERN ELECTRIC CO. • WASHINGTON WATER POWER CO.
UTAH POWER & LIGHT CO.

Whether modest or elaborate, a model electric kitchen display is a big advantage to any dealer in making sales. It helps him not only to sell the range but the refrigerator, dishwasher, kitchen mixer, small appliances, and if he has a wiring department, lighting and convenience outlets. For it gives his prospect a picture to carry in her mind as to what she might do with her own kitchen. To fulfill this picture she will be receptive to the thought of buying appliances that fit into it. The wise dealer will do everything he can to create and to maintain that picture of a complete electric kitchen—it means business to him

What the Electric Range offers the Customer—

[and therefore what you should talk about in your ads, displays, sales talks, to make more sales and net profit]

1. Tastier, more appetizing food

—looks, tastes, digests better (explain why fresh air cooking at controlled temperatures retains color, flavors and juices, increases digestibility of tough meats).

2. Better health

—because vitamins are conserved, mineral salts retained with waterless steam cooking by electricity. (Get the facts on this from your utility. It makes a dramatic, thrilling story that will help make sales).

3. Less time in the kitchen

—which means leisure, or the opportunity to devote time to some other desired activity—because time is saved in preparation, in supervision of cooking, in cleaning up afterward by electric cooking.

4. So simple to use

—nothing to get out of order, simple three-heat switches, most cooking can be done "coasting" on an element, heated and turned off. Oven can be left to turn itself on and off. No guessing as to results for there's no variation in heat or control.

5. A clean kitchen,

—clean pots and pans, as easy to keep sparkling as a china dish—(give reasons for this).

6. True economy,

—not only in electricity, but in food shrinkage saved, ability to cook cheaper cuts of meat to tenderness, and in lowered housekeeping costs. Brings the customer down on wholesale blocks of the electric rate and makes other additional uses of electricity cheaper.

7. Good looks

—an addition to any home, smartly styled, clean looking, sanitary, modern, up-to-date (even the President has had one installed in the White House).

8. Will continue to give assured cooking results

—for years—because of sturdy construction, type of heat and its application.

9. A cool kitchen,

—because heat is used efficiently to cook, not to waste itself heating the air. A blessing in summer, permits the economy of more efficient heating methods for the entire house during winter.

10. Fast as any fuel;

—speed with control added. (Infra-red heat has been proved most penetrating. All of electric range heat is in the red spectrum).

Advertise

1. *Tie-in ads* with utility space, directing folks WHERE to buy.
2. *When utility runs general ads,* use ads that tell features of the range you carry.
3. *Order and use display material* offered. It ties in with national advertising and identifies you with it. The prestige of the widely known make assures your customer of quality and performance.
4. *Use cards, broadsides,* blotters, any special advertising ideas to bring public attention to your store.

Display

1. *Have an electric kitchen,* even if modest and simple. It makes an ideal place to demonstrate actual use, helps visualize the complete electric kitchen idea that you can sell toward, makes a fine setting for cooking classes, lectures, etc.
2. *Arrange a group of ranges* where traffic is heavy. Expose them to a lot of people.
3. *Make a simple, striking window display.* One range is enough if attention is spotlighted on it. Tie-in with any special campaign slogan.
4. *Make use of Fairs and Expositions*—even a display in the lobby of a busy local theater keeps your name before the public. Utilize newspaper or utility cooking schools.
5. *Conduct home demonstrations,* similar to the aluminum sales stunt, furnishing the luncheon to a group of friends of some proud new range owner while you get across a good selling demonstration that will bring you new prospects.
7. *Make up a customer selling manual* of your own, using pictures clipped from magazines, catalogues, newspapers, etc., to illustrate and dramatize your sales story. The very work of organizing this material will prime you for effective selling as nothing else can.

Demonstration Routine

1. *Have a range connected* up so that you can demonstrate it.
2. *If your manufacturer* has worked out a routine for demonstrating your range, use it. Probably there is sound reason for every step of it.
3. *Start by calling attention* to the beauty of the range and ask your prospect to visualize how it will enhance her kitchen; bring it up to the minute. (Be careful not to infer that her kitchen does not look good now. Rather ask her to visualize how it can improve the looks of her own kitchen).
4. *Your customer is interested* in what it will do. So proceed to cook something that doesn't take more than five minutes and let her taste the result. (Your manufacturer will suggest many of these to you). At the same time bring out the selling features of your range—describe the quickness of new electric ranges, their cleanliness, safety, preservation of nourishing vitamins and mineral salts.

← (See next two columns).

6. *Interpret every manufacturing feature* in terms of what it means to *her* in ease of control, less housework, better cooking, taste and nourishment.
7. *Close your demonstration* by asking if you can make the delivery on a certain day. She has to think fast to refuse, and you can always come back with the suggestion that a day or so later might suit her better. You'll find that it helps to close if you keep the matter one of deciding what day to deliver.

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'Lectric Hens Bounce Back in Their Nests to Lay

By **SQUIRE PHINEAS BRIERWOOD**

FOLKS, I guess I told you last month about the NEW ERA that had dawned up here in the Hollow, how some city fellow was fixing up the farm so the whole darn place could be operated by pushing ELECTRIC buttons, didn't I? Well, he got everything pretty well fixed up and things are sure humming around here now. When he came up the last time he said he b r o u g h t a lot of KILL-O-WATTS with him, said they would cost me about 3 cents apiece and were worth 50. Of course I figured out right away that we could make 47 cents on every one and so I asked him how many could I get. Said the supply was unlimited, that I could have all I wanted at that price—in fact he said the more I took, the less they would cost—had a RATE on 'em or something. This is certainly the greatest thing that ever came to Squirrel Hollow, in fact if everything comes out as he said I can see where ma and me will get that trip to You-rope after all.

Of course it's too early for Spring plowing so we haven't had a chance yet to try out the ELECTRICAL REMOTE TRACTOR CONTROL—seems like that was what he called it—but the chicken-house installation is the darndest thing you ever saw. First thing he did when he started on that job was to go into the kitchen and fix on the wall what he called a CHART right over the table we et off of—said it would register just what was agoing on in the chicken-house—that is—every time an egg was layed the chart would of itself mark off another one. He explained this by saying that out where the hens were, he had installed an ELECTRIC EYE that watched every move they made, in fact blinked every time a hen layed. Got so they were right on their toes and just a little bit afraid for if it blinked after one hen had contributed, all the others thought it was blinking at them and so they got busy too. And the chart works fine. Only yesterday Stub Callows—that's Jeremiah Callows youngest boy who works down in Lem Brewster's grocery—came up for the eggs.

Said to ma, "How many you got?"

Ma said, "Five dozen and ten."

"Too bad," said Stub, "you can't make it an even six."

"Wait a minute," ma says, "I've just got two more." And darn it all if the chart didn't register an even six itself so ma knew two more hens had layed in the last 5 minutes. If it keeps on like this a farmer up here wouldn't even need to be able to count and still make money. Of course he wouldn't know just how much he had but that wouldn't make any difference — other wealthy men are not sure either just how much they have. What with the electrical nest warmers, feed mixers, eye counters and watchers and all the other things, ma and me figured it out that we are just as good as rich right now.

I asked the electric fellow if he didn't have one of them EYES that we could hang on the corner of the barn right up under the eaves so it could look the whole place over every night and keep a watch on things. Only last week Josiah Bevans had 40 of his finest Rhode Island Reds stolen by some sneaker and I know that prowlers have been around here too.

It sure does seem that we farmers have been missing a lot of the good things of life up here in the Hollow, as this ELECTRICITY for rural folks is really the darndest thing we ever heard about. Lem Brewster said that he never seed so many eggs before from one place in the Winter time as ma has for him.

Before I leave my report on the chicken installation I would like to tell you about another contraption that this electrical fellow spoke about. What he suggested was that we install a movable floor in the chicken-house—kinda loose like—s u p p o r t e d by a lot of little springs. Then in the morning, when the electric clock turned on the lights at six and the chickens woke up, whenever one jumped down from the perch onto this floor, the springs would toss it right up again into one of them warm, comfortable nests, down would drop a little door and the chicken would have to lay before it could get anything to eat. Of course I asked him right away how about the roosters jumping down, what became of them. But he knew his business, this electric fellow. Said that the roosters were heavier than the hens, weighed more, and so the springs would toss them a little higher—in fact right over a partition and into the yard where they could go to work right away scratching out worms for the hens so they could have a little meat for breakfast. I didn't install one of those but it sounds pretty good at that.

Before I close I suppose I ought to tell you about what he called the SIGNTIFIC EGG DEVELOPMENT SYSTEM but I guess I'll have to put that off for another time. My report next month will cover the subject, "ELECTRICITY—what it can do for COWS."

Engineering Symposium + + +

[A monthly forum in which engineers will present and discuss their problems, this department is dedicated to advancing the art of power generation, transmission, distribution and utilization]

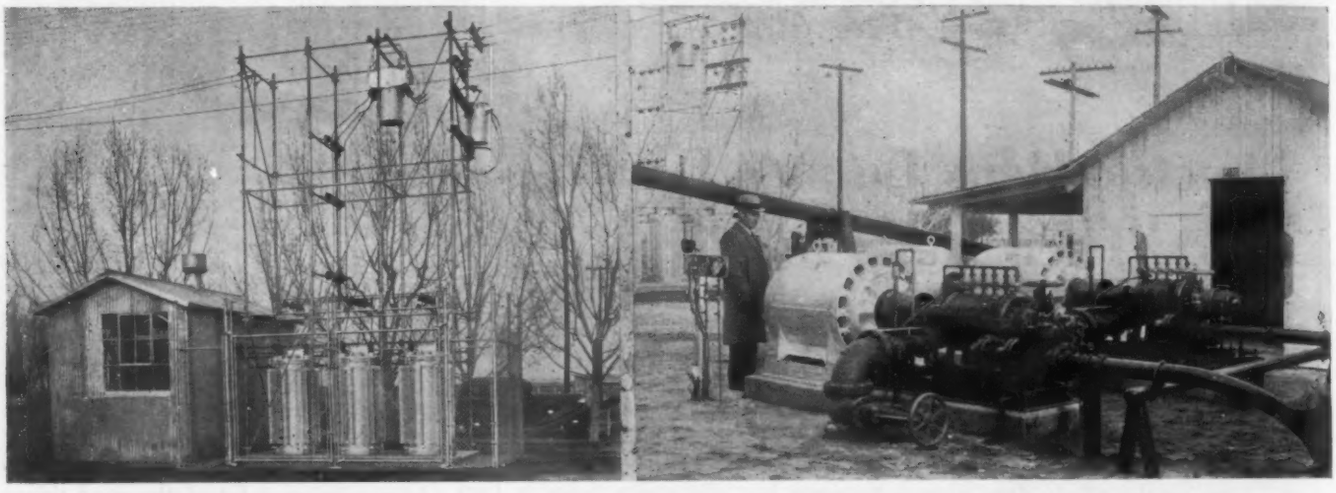


Fig. 1 (left)—Transformer installation for oil pipeline pumping plant. Capacity is 600 kva. Fig. 2 (right)—Motor installation of 600 hp. on oil line pumps

Feeder Regulation Permits Service to Varied Loads

By H. H. MINOR
Distribution Engineer, San Joaquin Light & Power Corp.

ELECTRICAL serving companies are confronted with two major problems. They must continually increase sales, and must provide that type of service that will prove satisfactory to those served. They must find new customers and must sell to existing ones greater use of their product. They must convince all that their claims that electric energy will perform to better advantage than any other available source of power are facts and not just sales talk. They must expand if they are to prosper, and in order that they will be able continually to add to their load, they must keep their customers sold.

Those who use electric service are exacting in their demands. They expect and must have that service in the correct form to meet their requirements just when they want it. Delayed delivery, substitution of another brand or a different sized package will not do for the electrical power merchant. He is not as fortunate as those selling other products. Keeping customers sold requires meeting those exacting demands to provide the type of service that will insure the operation of all utilization equipment in a perfectly satisfactory manner. Those who are responsible for the delivery of electric service to the user must back up the sales and advertising forces. They are doing a fine job and deserve all possible assistance.

Providing adequate service, delivering the product when and where it is called for is the task of the engineering and operating personnel of utility organizations. It is their duty to so plan and build and operate the properties that the right kind of service is always available. They must look into the future as far as it is humanly possible to do so; they must so organize their forces that new construction can be quickly completed; they must provide the proper equipment to insure the delivery of energy at the proper voltage at any time; and they must always have in mind costs. They must choose the plan and install the equipment that will provide the service required in the most economical manner. Not only must they think of capital outlay for the installation of the equipment used, but they must have in mind maintenance expense, probable obsolescence and operating costs as well. They must provide that adequate service for the lowest possible overall expenditure.

Like the sales and advertising forces the engineers and operating men are doing their part as is evidenced by continued improvements in service and continued reduction in rates. Neither group could succeed alone. They must and do work together for the good of their company and its customers.

Of the many problems confronting the engineer, one of the most difficult is to provide reasonably good voltage regulation on long rural feeders. This is often complicated by the time element involved. He must work quickly in order to furnish the energy when desired. Proper equipment may not be immediately available and resort to temporary expedients is sometimes necessary. Such temporary arrangements must fit into the final picture and not cause undue waste.

The usual rural feeder will supply a mixed load. Lighting, heating, power will probably all be served. These loads will be scattered from end to end of the circuit. The measure of good voltage regulation is that which is satisfactory for the most critical of those loads. Regulation that will be perfectly satis-

Editor's Note

This is the first of three articles by Mr. Minor dealing with the subject of voltage regulation. Each covers a specific problem and presents the solution finally adopted to provide satisfactory service to the various types of consumers.

factory for a motor load may be entirely inadequate for a domestic range. High voltage that would not be noticeable for a motor may cause excessive burn-outs of lamps and heating elements. The engineer must know the type of loads to be served and plan accordingly.

A recent problem illustrating the above generalization proved quite interesting. An existing 12,000 volt feeder some fifteen miles long was supplied from a 70,000/12,000 volt substation and paralleled a main highway for its entire length. It served a scattered assortment of residences, service stations, auto camps, garages, etc., and at its extreme end supplied a fair sized resort with the usual cottages, hotel, restaurant and small power loads. The feeder was No. 2 copper, three phase three wire, using flat construction on 40-ft. poles. A second feeder, also of No. 2 wire extended in the opposite direction along the highway. It was built under the 70-kv. line supplying the substation and functioned as a tie line between that substation and an adjacent one.

An oil pipe line paralleled these 12,000-volt lines, on which there were located four pumping plants. Culminating a long drawn out sales effort early in 1935 there were installed at each of these pumping plants, motor driven pumps replacing in part steam driven equipment. Three of the installations were 200 hp. and the fourth was 250 hp. Three of these plants were adjacent to the first feeder described above and are located respectively three miles, eight miles and thirteen miles from the substation. The 250-hp. pumping unit was installed at the thirteen mile station. The fourth pumping installation was located adjacent to the tie line mentioned above.

These electrical installations were of an experimental nature, their operation and costs being compared with the existing steam plants. They were served directly from the feeders described. Although the voltage drop to the end of the feeder serving three of the plants was some 8 per cent, fairly satisfactory service was provided by changing taps on distribution transformers where necessary. The fact that these oil pumps operated almost continually made this arrangement possible.

Some few months after this initial installation application was made for an increase at each of the four pumping stations of 400 hp. Service was requested in thirty days.

Ample facilities were available to serve the plant adjacent to the tie line, but the increased load resulted in a total of 1,850 hp. for the three plants being served from the 15-mile feeder. Obviously there must be some fast work in order to give adequate service to that added load and at the same time to the existing load on that feeder and be ready within thirty days. Fortunately sufficient 70/12-kv. transformer capacity was available at the substation, but there was no regulating equipment of any kind and the characteristics of the transformers were such as to result in quite poor regulation. Distribution transformers had to be obtained and installed for the four plants. Very rapid work by one of the manufacturers provided these twelve 200-kva., 12,000/480-volt transformers in time. Special pipe structures to support the buses and an oil circuit breaker for each of these transformer banks were designed and built. One of these is pictured in Fig. 1. It will be noted that a lighting transformer is installed on one end of the structure and connected on the line side of the oil circuit breaker controlling the power bank. This arrangement insured lighting serving in the event of the power bank tripping out.

Fig. 2 is a picture of one of the pumping plants. As will be noted they are outdoor installations. The motors in each case are 200-hp., 3,600-r.p.m. The single motor installation drives the original experimental pump and the two motor job is the more recent installation. That they have proven successful is evidenced by the fact that they have operated continuously for several months. That this uninterrupted operation is possible is due in part to the change to rotary pumps from the old reciprocal steam units. Excessive vibration or "hammer" which formerly necessitated considerable pipe line repair has been obviated. Shutdowns for that reason have not been necessary.

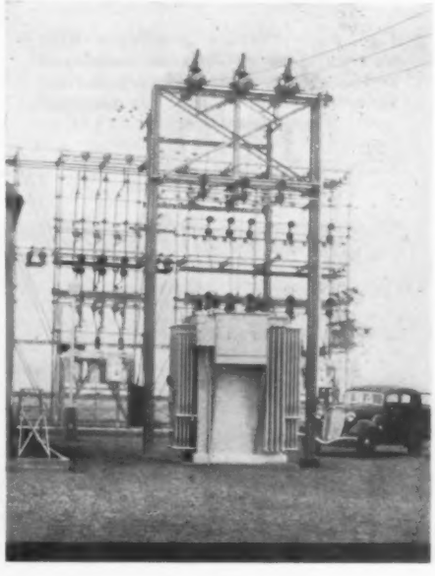
Thus the supply and the load facilities were rather easily cared for, but the distribution line was entirely inadequate for the load to be served. No diversity could be figured for this pumping load. It would all be operating at once, and would operate during the peak of the existing scattered load. A rough calculation revealed that 350,000 circ. mil conductor would be required to serve the total load and limit the drop to 5 per cent. This was impractical. If advantage were taken of operating two circuits in parallel thus cutting down the reactive drop, circuits of 1/0 copper would give the same result. With the existing No. 2 circuit in parallel with a 1/0-circuit the drop to the end of the line would be approximately 6 per cent.

While this would be within reason for line drop considering the character of the power load, it was not the whole story. As mentioned above, the substation transformers would afford poor regulation and there was no regulating equipment installed. Thus to the 6 per cent line drop would be added some 3½ per cent station transformer regulation drop and of course in addition there would be distribution transformer regulation and secondary drop. Thus the total fluctuation that might be expected would approach 12 per cent.

If regulating equipment were installed at the substation, the transformer regulation could be eliminated as well as such fluctuations of transmission voltage as might occur. Such equipment was not immediately available, however, and there was only thirty days time before the load would come on.

As a temporary expedient, therefore, an additional circuit of 1/0 wire was built to the plant situated 13 miles from the substation and the power load and lighting load at the three pumping plants was connected to it. The other load was still served from the existing No. 2 circuit. As would be expected this increased the drop to the farthest pumping plant to about 9 per cent. By operating the transformers at that plant on a low tap, proper voltage could be supplied. The drop on the existing circuit was not as great as it had been during the experimental period of operating the 200-hp. units. The voltage plane was some 3 per cent lower due to substation transformer regulation, however. In general the service to the scattered load and to the resort at the end of the line was very satisfactory. Again, although the rather excessive substation transformer regulation caused a lowered voltage plane, fluctuations in voltage were absent because of continuous operation of the oil line pumps. They were started and they kept working night and day. Their load factor is as nearly the

Fig. 3—Step voltage regulator installation of the type used to regulate the 12-kv. substation bus



desired 100 per cent as is possible.

Thus, temporarily, advantage was taken of the fact that power loads can be successfully operated with greater line drop than can domestic loads. It was felt, however, that eventually such continuous operation of the power load as was experienced during the first few months might not continue and that arrangements should be made to limit the voltage fluctuations that would be caused by varying this power load. Consequently a step-voltage regulator was purchased for installation at the substation supplying this load. It will regulate the 12-kv. bus and will have a range of 10 per cent raise and lower. Compensation will be available so that the voltage may be maintained at a point at or near the load center of the feeders.

Fig. 3 is a picture of a similar installation of such a step-voltage regulator. It will be noted that this installation is quite simple and requires no switching arrangement other than by-passing disconnects. Fig. 4 is a graphic representation of the voltage gradient on the original No. 2 feeder and the new 1/0 feeder, with the load divided as explained above, without the regulating equipment installed. These curves show very plainly the possibilities in dividing loads between two circuits, serving that load requiring close regulation from one and the less exacting power load from the other.

It will be noted that while the total fluctuation in voltage at plant No. 3, located 13 miles from the substation, may reach 12.3 per cent, the fluctuation at the end of the 15-mile lighting feeder is only 5.2 per cent. This assumes that the power load will be off at times but will be operating during the peak of the lighting load. Practically, as mentioned above, the continuous operation of the pumping load has reduced the maximum fluctuation at the end of this lighting feeder to less than 2 per cent.

In Fig. 5 is shown the result of installing regulating equipment at the substation to regulate the 12,000-volt bus, compensation being provided to maintain constant voltage on the power feeder approximately 5 miles from the sub-station. The volatge resulting for the power load is very good, the maximum fluctuation being 3.8 per cent at plant No. 3 and about 2 per cent at plants No. 1 and No. 2. The lighting feeder however is not helped by this arrangement. Under extreme conditions, that is with the proper load fluctuating from zero to full load, the lighting feeder will vary in voltage 7 per cent at its extreme end and 5.2 per cent at the substation.

This illustrates one difficulty encountered when bus regulation is used, in conjunction with line drop compensation, and the feeders are serving loads of different characteristics. As in this case, the heavily loaded circuit will determine the degree of compensation and may result in rather poor voltage conditions on a second circuit whose load is lighter. Very careful analysis of feeder loads and their characteristics is necessary if line drop compensation is successfully employed with bus regulation.

To have discarded compensation in this case would have resulted in very good regulation for the lighting feeder and a possibility of 9 per cent fluctuation of the power circuit at its extreme end. As previously stated it is most convenient to serve the lighting at the pumping plants from this power feeder rather than from the original No. 2 circuit. Thus the service to that lighting load would not be satisfactory if compensation were not used.

Bearing in mind the fact that the two circuits operated in parallel will result in less than 6 per cent line drop in this case, it was evident that such operation would adequately care for the voltage conditions on both circuits. Fig. 6 represents the voltage gradient for the parallel feeders with the regulating equipment installed at the substation and the line drop compensator set for regulation at a point some 5 miles from the substation. As will be seen, the resultant possible fluctuation in voltage at the extreme end of the feeder is 2½ per cent and that at the supply end is 3.1 per cent.

Thus a major power load adjacent to an existing feeder serving loads requiring rather exact voltage regulation was cared for by the temporary expedient of dividing the total load to be served into two general classes and serving them from separate feeders. The load requiring exact regulation, that is the lighting or domestic loads, were retained on the old feeder. The oil line pumping load was served from a new feeder. Temporarily both these feeders were supplied from the unregulated bus at the substation. Due to the fact that the power load was operated continuously, this arrangement resulted in very satisfactory operating conditions. In order to be able to provide satisfactory service, however, in the event this power load is not continuously operated regulating equipment was purchased and will be installed at the substation. The two feeders will be connected in parallel and compensation for line drop will be provided. This will result in excellent voltage conditions over the whole length of both feeders.

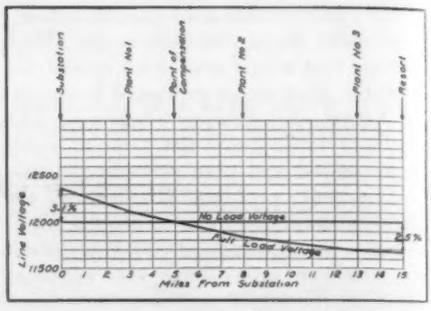


Fig. 6—Voltage gradient with regulator installed at substation and feeders operated in parallel

Fig. 4 — Voltage gradients with no regulating equipment employed and feeders operated separately. Transmission voltage is assumed constant

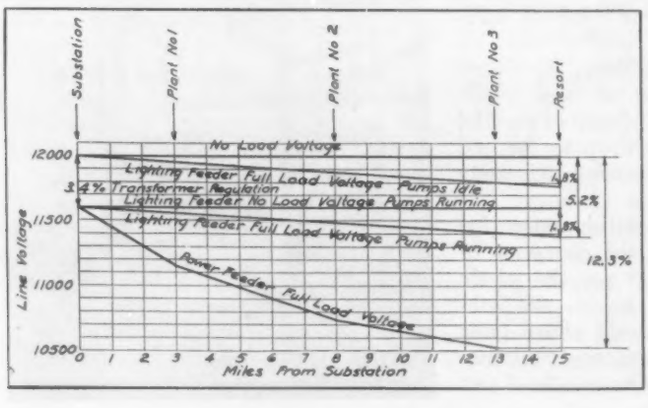
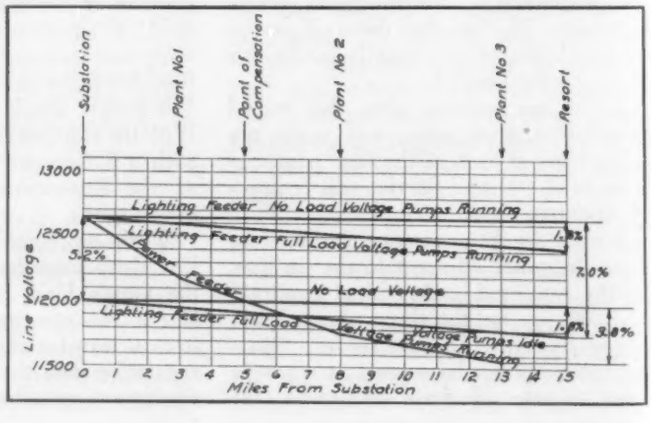


Fig. 5—Voltage gradients with regulator installed at substation and feeders operated separately



Flooding Eliminated by Sealed Underground Pumping Station

IN driving the 13-mile San Jacinto tunnel, a part of the Metropolitan Water District's aqueduct from the Colorado River to Los Angeles, coping with subterranean water flow proved to be a problem of no small magnitude. During the early stages of the construction the underground flow of water was larger than could be handled by deep-well type pumps suspended in the two shafts at points along the bore, which shafts permitted work to be carried on from four faces in addition to the portals.

When these several pumps in the shaft and tunnel were unable to handle the amount of water flowing into the workings, not only were the tunnels filled but the pumping stations flooded so that they could not operate at the time when they were most urgently needed.

M. W. D. engineers, in taking over the work to insure completion of the tunnel on schedule, decided to eliminate this ever recurring threat of flooding. This could be assured only if pumps were installed of sufficient capacity to handle a maximum flow of underground water and so arranged as to pump continuously should the tunnel itself be flooded. It was accomplished by installing the pumps in two chambers, hewed out of solid granite near the base of the shafts and by making access to these chambers through water tight bulkheads. As the installation at each shaft is similar, and since the larger amount of water is encountered at the Potrero shaft, the under ground pumping station there will be described.

At the time the pump chamber was designed for the Potrero shaft, which is 796 ft. deep to the top of the tunnel, the maximum flow of water from the headings being advanced in both directions from the bottom of the shaft amounted to 5,500 gal. per min. or approximately 12 cu. ft. per sec. This figure represents the sustained flow which had not lessened depreciably from months of pumping and which was expected to increase as the headings advance. Therefore it was decided to install pumps having a total capacity of 15,000 gal. per min. To provide adequate space for pumps and auxiliary equipment, a chamber was carved in the granite at one side of the tunnel, the dimensions of the chamber being 95 ft. long, 19 ft. wide and 22 ft. high, connected to the tunnel itself by a restricted section 16 ft. long, 22 ft. high but only 4½ ft. wide. Installed in the chamber are five, four-stage, horizontal centrifugal pumps, each rated at 2600 gal. per min. and two units rated at 1000 gal. per min., all of which operate against an 850-ft. head. The larger pumps are driven by 700-hp. induction motors and the smaller by 300-hp. induction motors.

Problems encountered in the design of the underground pumping station included ventilation, the difficulty of removing the heat due to motor losses, remote control and automatic operation of each pump to insure continuous operation even though the tunnel were flooded, and the removal of seepage from the chambers. The continuous operation of the entire station is dependent upon the proper functioning of each component part.

To adequately cool the motors and also the pump chamber a duplex air cooling unit was provided. The cooling unit consists of two water cooled fin-tube coil banks, duplicate blowers and cooling water circulating pumps; all enclosed in a two-compartment steel plate housing. Cooled air is supplied to the motors through duct manifolds, and returned through similar ducts to the cooling unit for recirculation. The motors are encased for forced air ventilation. Each fan has a capacity of 20,000 cu. ft. per min. at 6 in. w.g. and each cooling coil bank a heat transfer capacity in excess of 1,000,000 b.t.u. per min. when supplied with 400 gal. per min. of 70-deg. F. water. Each section of the duplex cooling unit serves as a spare to the other.

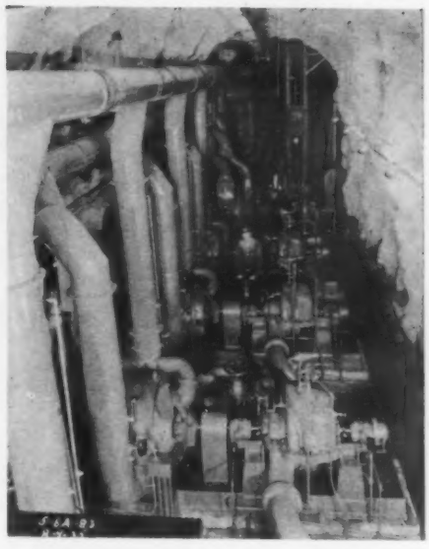


Fig. 1—Interior of the Potrero Shaft underground pumping station where 4,500 hp. is sealed in a water tight cavern 800 ft. underground.

Fresh air (oxygen supply) is supplied to the pump chamber by a positive blower at the surface through a 3-in. pipe suspended in the shaft. A 3-in. vent line is also provided from the chamber to ground surface. Water seepage into the chamber is discharged into the tunnel by two duplex power pumps.

After installation of equipment in the chamber had been completed the restricted section joining the tunnel and the chamber was closed with a heavily reinforced concrete plug 14 ft. thick. Access through the plug into the chamber is provided by a gasketed steel door, sufficiently large for all equipment to be moved through it. In the larger door there is a secondary door 2 ft. x 3 ft. serving as a manway. These entries are designed to be water tight and withstand the pressure of an 800-ft. head of water which would result if the shaft filled to the top.

Fig. 2 (Left)—The main doors through the 20-ft. concrete plug sealing the pumping chamber from the tunnel. (Right)—The small "manway" door in the main door shown at the left.

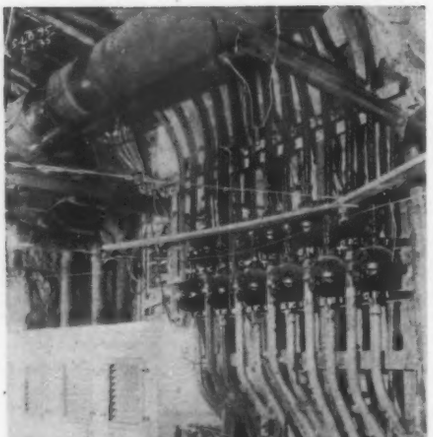
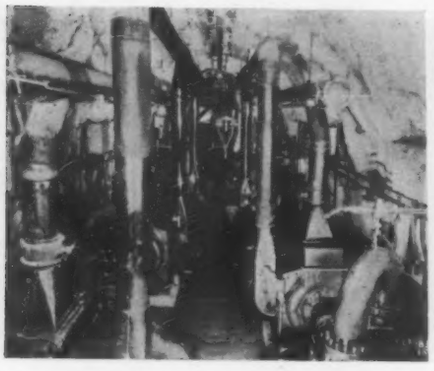


Fig. 3 (Left)—Power circuits, carried in mine shaft cable down the shaft from the surface, terminate in the bomb-shaped junction boxes where they are spliced to the lead covered cables which are carried through the concrete plug into the pump room. The entire electrical installation will operate even though the tunnel and shaft are filled with water.

Power Supply

Continuity of operations being essential, the power supply for the underground pumping station also must be as reliable as is consistent with good economics. The main 2.3-kv. sectionalized, double bus structure is housed in a building at the top of the shaft. The double bus is split into two sections and provided with transfer switches at both ends to insure complete flexibility. Also in this building are installed the remote electrically controlled oil circuit breaker type starters for all of the larger motors in the underground pumping stations. Power circuits are taken off the bus through disconnecting switches and the starting panels and then in three-conductor mine shaft cable down the shaft. Cables are racked and suspended along one part of the shaft terminating at the lower level in a new type of junction box designed specifically for this purpose by M. W. D. engineers. These junction boxes are spherical in shape and formed from two castings, as shown in the accompanying photograph. The mine cable terminates in the upper half of the junction box in a wiped joint, the space between the lead shoulder and the end of the armor on the cable being made water tight by wrapping with tape painted with rubber cement and the entire wire joint varnished afterward. Within the junction box the three conductors are fanned out and spaced by passing through holes drilled in an insulating partition inside the junction box. Then the ends are spliced to the three conductors of a lead covered cable wiped into the lower half of the junction box, the two halves of the box then being assembled and the box filled with compound. The lead covered cable is carried in conduits running through the concrete plug sealing the water chamber from the tunnel, the conduit run being sealed off to make it water tight. On the inside of the chamber the lead-covered cable is carried to each individual motor where it terminates in disconnecting switches housed in metal boxes the covers of which are padlocked to prevent unauthorized tampering.

Fig. 4—The underground pump room at the Cabazon Shaft indicates the type of rock from which the pumping station is carved.



Dual control stations are provided for each motor. One control station is located in the pump chamber beside each motor, while the other one is located in the bus house on the corresponding motor starting oil-circuit-breaker cubicle. The reason for the dual control stations is that the control of the pumps would not be lost if adverse flood water conditions required the sealing of the pump chamber. The cables comprising each of these control circuits, consist of four conductor No. 12 rubber-covered, solid wires with lead sheath and steel armor tape. Each cable is brought through the concrete plug into the pump chamber in a conduit, which has fastened to it, at each end, a bronze sleeve to which the lead covering of the cable is wiped.

Each motor has a mercoid thermostat located in the discharge side of the ventilating case and as near the stator windings as practicable. Each of these devices is connected into the control circuit of each motor so as to open the motor breaker if excessive temperature in the motor should occur. In order that the operators may know when the unit is shut down from excessive temperature, annunciators were provided in the pump room and in the bus house. The annunciator merely consists of a panel with a red pilot lamp for each motor. A bell and relay are also provided to attract the operator's attention. All annunciators operate on 32 volts d.c., and as the lamp current is very small, a multi-conductor telephone cable is used for the circuits between the motors and the annunciators.

Pilot lights and dual control are also provided for the motor ventilating equipment, so that the operator in the pump house may know whether or not the equipment is operating and receive warning when the standby fan should be started. The 440-volt, a.c. fan motor starters and protective devices are located in the pump chamber and are protected by thermal overload relays of the self-resetting type.

A similar underground pumping station is installed at the Cabazon shaft where a capacity of 13,500 gal. per. min. of pumps capable of acting against a 250-ft. head is installed. By taking into consideration all factors affecting reliability and designing the installation so that the pump rooms will operate irrespective of whether or not the shaft is full of water, M. W. D. engineers have eliminated the threat of flooded workings and have insured the maintenance of a rate of progress which will insure completion of this 13-mile tunnel on schedule.

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Winter Finds Utility Prepared For Quick Service Restoration

Probably one of the most valuable advantages of central station service is the ability of the modern electrical system to concentrate men and equipment anywhere over a wide area where the continuity of power supply is threatened. Illustrative of this was a recent accomplishment of line crews of the Washington Water Power Co. which repaired heavy damage to over a mile of 60-kv. line in less than 8 hours.

Warm air from the Columbia River gorge moved inland and met cold air from the mountains in the vicinity of Davenport, Wash., the result being the formation of a heavy coating of ice on the transmission line. R. C. Kelley, of the transmission department of the power company, realizing that a continuation of this condition would result in an outage of the transmission line, ordered a line crew to stand by at Davenport. Two other line crews with truck loads of supplies were immediately sent from Spokane and Moscow, Idaho.

The ice formation, weighing as much as 4 lb. per foot, tore down twenty-one 300-ft. spans of the line, breaking crossarms and splitting poles in the process. The service was interrupted at 9 a.m. and completely restored at 5 p.m., a record considering the magnitude of the job.

Charts Simplify Rate Calculations

By RAY B. PLASS

Electrical Engineer, W. Harry Archer & Associates, Consulting and Industrial Engineers, San Francisco

INTRICATE rate schedules which involve considerable calculation in their application frequently may be reduced to simple terms by charting them in a manner which will facilitate the determination of the average rate earned for any given load and consumption. For example, on Jan. 1, 1936, the Pacific Gas & Electric Co. put into effect several new electric schedules covering domestic, commercial, and industrial consumption. To facilitate estimating the cost of commercial and industrial uses charts have been prepared for three of the new schedules. These give approximate costs in cents per kw.-hr. for different relations between the energy used in a month and the "billing" maximum demand. For the schedules containing a power factor clause, P-15 and P-30, auxilliary curves show the per cent of correction to be applied to the total billing.

The shaded areas in the P-15 chart indicate the zones in which a lower rate may be obtained by basing the charges on a greater maximum demand.

The example sketched on chart P-15, for a use of 320,000 kw.hr. per month with a billing demand of 1,700 kw., point "A", shows that the cost per kw.-hr. is 1.27c. If the power factor is 90%, there will be a 3% credit, making the monthly bill 320,000 × .0127 — $4,064 less 3% — $3,942. As point "A", however, lies within the shaded area a saving can be made by increasing the billing demand to the next higher demand range or 1,865 kw. (point "C") in which case the monthly bill would be 320,000 × .0123 — $3,936 less 3% — $3,818. If the load can be manipulated so as to reduce the maximum demand to 1,200 kw. then the monthly cost will be found from the value indicated at point "B", or 320,000 × .0113 — $3,616 less 3% — $3,508.

SCHEDULE C-4 is an entirely new combination schedule primarily designed for commercial applications in which lighting predominates. It combines lighting, electric heating, and electric power and therefore supersedes two or more separate schedules previously used.

Service Charge: per month.....$2.00

Energy Charge (to be added to the service charge)

First 1,000 kw.-hr. per month.....	3.4c per kw.-hr.
Next 2,000 kw.-hr. per month.....	2.7c per kw.-hr.
Next 7,000 kw.-hr. per month.....	2.2c per kw.-hr.
For all excess over 10,000 kw.-hr. per month:	
*First 50 kw.-hr. per kw. of maximum demand	2.0c per kw.-hr.
Next 150 kw.-hr. per kw. of maximum demand but not more than 75,000 kw.-hr.....	1.3c per kw.-hr.
All excess	0.8c per kw.-hr.

SCHEDULE P-15 is designed primarily for industrial concerns of moderate size. It is quite generally comparable to previous schedule P-1. There is in effect, however, a schedule still called P-1 but it is applicable only to very small industrial users.

Billing Demand k. w.	**Rate per kw.-hr. for Monthly Consumption per kw. of the Billing Demand: First 67 kw.-hr. per kw.	Next 67 kw.-hr. per kw.	Next 200 kw.-hr. per kw.	All over 334 kw.-hr. per kw.
0- 18	3.4c	2.0c	1.1c	0.9c
19- 37	2.9	1.9	1.0	.8
38- 74	2.5	1.7	1.0	.75
75- 186	2.2	1.5	.9	.7
187- 372	2.0	1.3	.8	.65
373- 745	1.9	1.2	.8	.6
746-1,864	1.8	1.1	.8	.6
1,865-and over	1.7	1.0	.8	.6

SCHEDULE P-30 is for large industrial users and for most conditions will be found more favorable than the old schedule P-5. Both schedules are in effect but only in the event that a consumer has a poor power factor or an unusually fluctuating use of power from month to month will P-5 be found more advantageous.

Rate (A):

Service at 2,200 volts up to and including 25,000 volts

Demand Charge:	Per Month
*First 200 kw. or less of maximum demand.....	$300.00
Next 300 kw. of maximum demand.....	1.00 per kw.
Next 500 kw. of maximum demand.....	.75 per kw.
Next 1,000 kw. of maximum demand.....	.60 per kw.
All excess kw. of maximum demand.....	.40 per kw.
Energy Charge (to be added to the Demand Charge):	
First 150 kw.-hr. per kw. per month.....	7 mills per kw.-hr.
Next 150 kw.-hr. per kw. per month.....	5 mills per kw.-hr.
All over 300 kw.-hr. per kw. per month....	4 mills per kw.-hr.

*"Maximum demand" will be the mean of the metered maximum demand for the current month and the highest demand occurring in the year ending with the current month.

**"Billing demand" will be the metered maximum demand for the current month but not less than 50% of the highest demand during the eleven preceding months.

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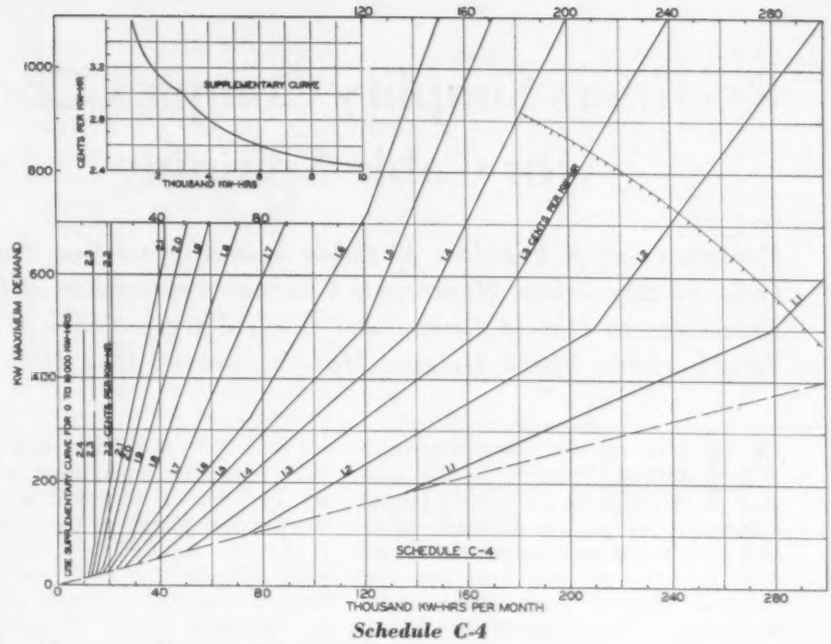
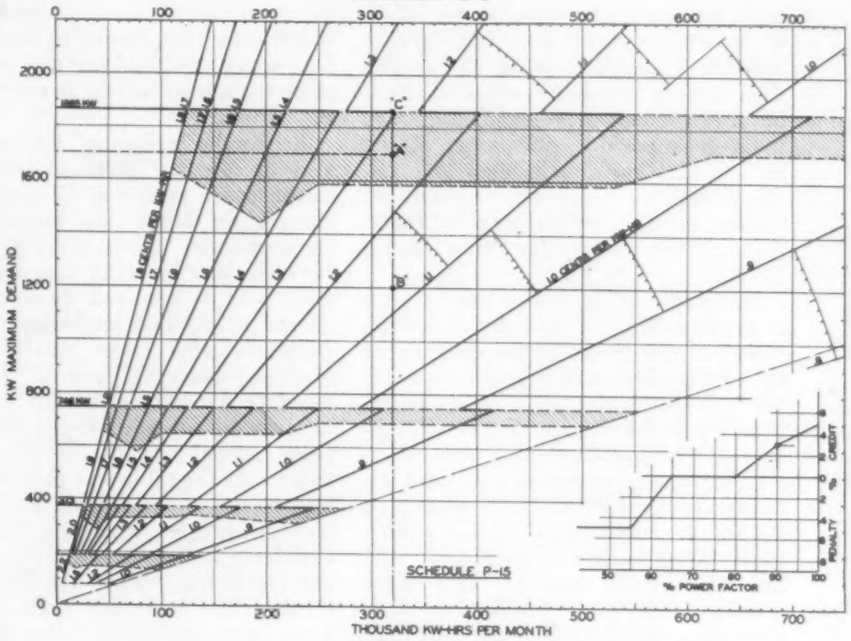
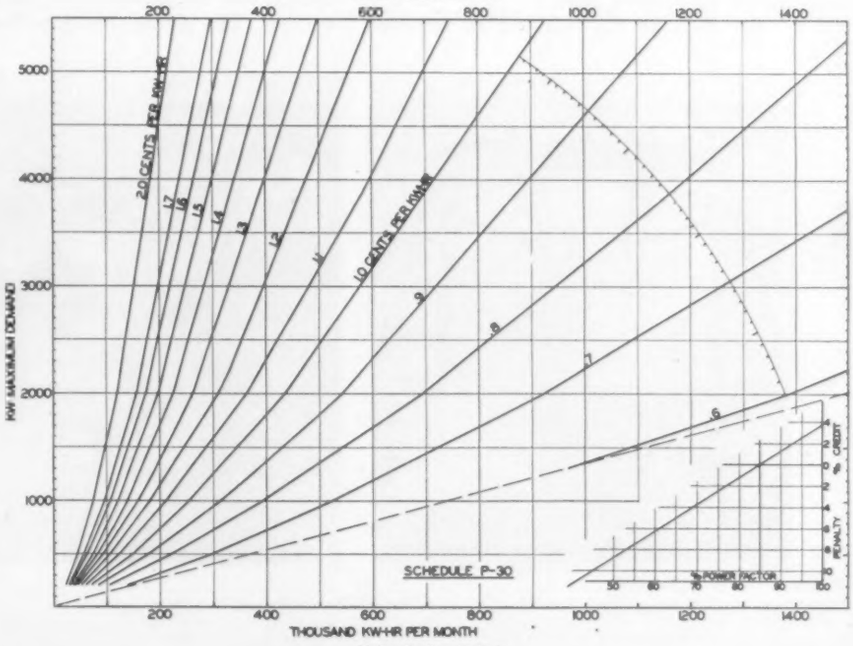


Schedule C-4



Schedule P-15



Schedule P-30

Rectifiers Simplify Complex Control for Cable Spinning

Remote Control Problem of Cable Spinning on San Francisco-Oakland Bay Bridge Represents Unusual Application of Control Principles to Obtain Centralized Control Over Three Wires of Two Variable Speed Driving Motors Located One Mile Apart.

Fig. 1—View of the first suspension span looking toward the center anchorage and Yerba Buena Island. The structural work on the cantilever structure on the east side of the bay may be seen at the right of the island

MANY are the interesting engineering features in the construction of the world's largest suspension bridge, the 23,000-ft. structure now being built across San Francisco Bay between San Francisco and Oakland. East of Yerba Buena Island the bridge is of the cantilever type almost 2 miles long. West of the island it is composed of two approximate 5,300-ft. suspension spans in tandem, each span a complete bridge in itself having a common central anchorage point constructed in the center of the bay. The suspension bridges are connected with the cantilever structures by means of a 76-ft. vehicular tunnel bored through the center of Yerba Buena Island.

No feature of the bridge construction is as interesting or as novel from the electrical standpoint as the spinning of the cables which will support the roadway. These cables, each consisting of 17,464 parallel strands of special high-strength, corrosion-resisting steel wire, must be strong enough to withstand the 38,000,000-lb. pull which the weight of the structure will apply to the anchorages. When completed each cable will have an outside diameter after compressing of 28¾ in. Cables were constructed in pairs, those of the west span being completed first.

As each of the two cables required for each span is about a mile long, the cable spinning operations necessarily involved one of the most lengthy and complicated phases of the construction. It was to simplify and expedite the cable spinning that a new and ingenious method of electrical control was devised by engineers of the General Electric Co. The control of the spinning process was further complicated by the fact that four wires were laid per trip across the structure instead of two as was formerly the custom.

Briefly the "spinning" operation consists of carrying bights of wire across the structure from east to west and anchoring the loops thus formed at the far anchorage. Then, from reels at the far end, other bights of wire are carried from west to east and these loops anchored at the east anchorage. To accomplish this two double-grooved sheaves known as "jennys" were fastened to a continuous cable extending between the two anchorages, the sheaves being spaced exactly one span length apart. As the cable was pulled around, one sheave traveled from east to west carrying two loops and the other traveled from west to east carrying another pair of loops. When the sheaves arrived at the opposite anchorage, the loops were pulled off, other loops installed and the direction of the cable reversed. The action thus established was very similar to that of a shuttle in weaving. A duplicate installation lays the other cable of the span.

The principle requirements of the electrical power for the cable haulage are as follows:

(1) Power must be applied at both ends of the cable to avoid excessive strains in the loop; (2) Slow acceleration is essential to conform to the large moment of inertia of the heavy cable reels from which the bight is taken; (3) Motors must accelerate together and be controlled from one point, adjustable speed being another requisite of the installation; (4) absolute reliability and quick maintenance is imperative because the fixed charges on the tremendous investment involved makes delays due to machine outages extremely costly.

To meet these requirements, two 75-hp. wound-rotor induction motors were selected to drive each haulage cable, the motors being geared through a reduction to driving sheaves. One driving unit for each of the two main cables was placed at the center anchorage and another on the shore end of the haul.

Since the continuous cable hauling the "jennys" is propelled by these two motors a mile apart and served from different sources of power, and since continuous operation over a wide speed range is necessary, it is apparent that the control system not only must be reliable but also cause essentially the same operating characteristics to be assumed by the two motors.

Furthermore, to avoid the "personal errors" that might damage the apparatus if two operators were controll-

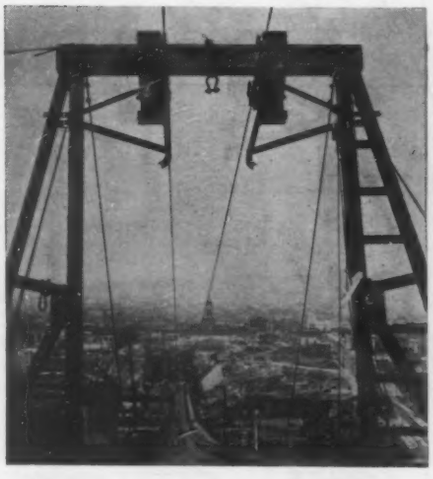


Fig. 2 (Right)—One of the grooved sheaves fastened to the haulage cable in position at the San Francisco anchorage preparatory to having the two next bights of cable installed for the eastbound trip. Details of the I-beam anchorage can be seen. (Left)—Closeup of the haulage cable guides installed at intervals across the span

ing the system and to assure the utmost reliability in the operation, the control had to be under the direction of one operator even though half of the main drive was over a mile away. This further complicated the control system but not to the extent of the final requirement demanded by the construction company that the control wiring be kept to an absolute minimum. This limitation was imposed because other construction activities also required numerous electrical circuits in the limited space available for that purpose on the top of the towers and on account of the added expense that would be incurred for each extra mile of control wire. It had been already decided that the power circuits would be eliminated across the span during the construction inasmuch as power already was available at either end and on the center anchorage.

To further economize on time and equipment, it was decided that the west span cables would be laid first, using the center anchorage as the common control point. Thus after the west span cables were completed, the electrical equipment on the far (or San Francisco side) could be moved to the island to spin the east span cables thereby minimizing the change-over of the central anchorage control station.

As finally laid out, the electrical control circuits for the spinning operations provided forward, reverse and exact speed control functions of both driving motors on each cable using but three control wires crossing the mile long span to the "far" end motor station. This unusual simplification of control circuits was made possible through an ingenious application of half-wave copper-oxide rectifiers together with motor-driven drum switches controlling the secondary resistance of the main wound-rotor induction motors.

As shown in the accompanying diagram two half wave rectifiers were connected in opposition at either end of one control wire, double throw switches being provided at the control end. It will be seen that in one position of the double throw switch two of the half wave rectifiers at either end of the span worked together allowing current to pass through one control wire but, the other half wave rectifier being in opposition, prevents energizing the contactor coil in that circuit. In the other position the reverse is true. Thus selective operation of the directional contactors is obtained for both the forward and reverse directions of rotation of the motor. For speed control, motor-operated drum switches controlling the speed regulating duty resistors were provided, the pilot motor on the drum switches being controlled through another set of half wave rectifiers over a second control wire in the same manner as with the directional switches. "Fast" or "slow" direction of pilot motor rotation is obtained by a spring return master switch. In the fast direction the operator merely selects the "fast" position of the speed control master switch and maintains contact until the pilot motors have moved the controllers to the desired speed. The pilot motor stopping on that point when the master switch is released. When the motors are de-energized, the pilot motors automatically return the controller to the "off" position.

By means of positioning segments on the motor-operated drum switches, in conjunction with suitable relays, the drum controller positions of the "near side" and "far side" motors are synchronized. Thus the rotor resistances in the secondary circuits of the two motors are kept alike. It is therefore made impossible for either drum switch to get ahead of the other in either direction of travel.

If the traction motors are shut down either manually or automatically, both drum switches automatically return to the off position. By-passing switches are also provided so that the traction motors may be run independently should conditions make such action desirable.

Because the operator cannot see what is happening along the mile long travel of the sheaves and because in case of trouble immediate shutdown of the driving motors may be imperative, a number of safety switches are connected in series along the span so that the men stationed at various intervals along the spinning operation can shut down the equipment by opening any one of these switches. In this connection the small pilot light at the operator's control platform is connected through a 10,000-ohm resistance so that when all the switches along the span are closed sufficient current will pass to light the signal lamp although the current is not large enough to energize the contactors. Thus the operator knows when everything is in readiness for the next trip.

This application of obtaining centralized control together with directional operation and speed regulation with but three control wires undoubtedly will find wide application in other industrial projects where the operation of widely scattered units must be coordinated.

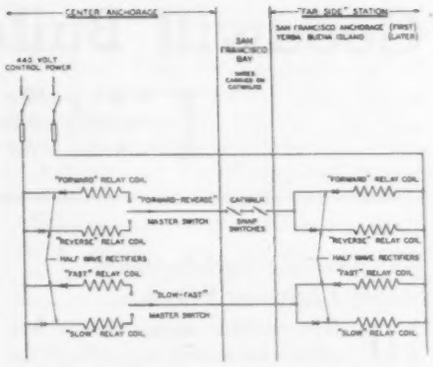
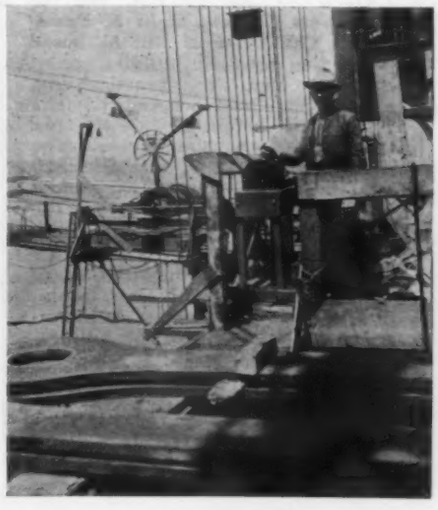


Fig. 4—Control diagram showing the essential circuits in the selective control made possible over three wires by the use of half-wave rectifiers. This combination permits economy in circuits and reliable supervision of remote stations



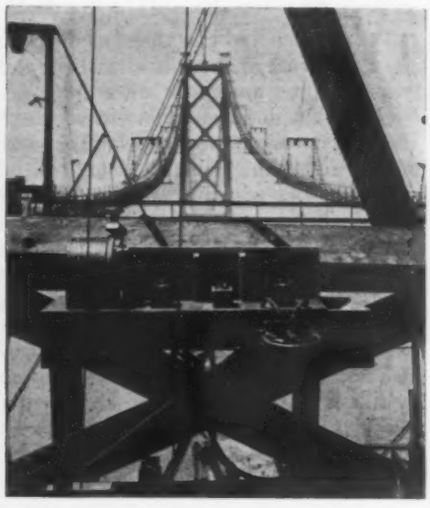


Fig. 3 (Right)—The control pulpit on the center anchorage. With these switches the operator can control the starting, accelerating and travel not only of the center anchorage cable haulage and control equipment but also that on the San Francisco side a mile away—all over three wires. (Left)—Joe Bergman, electrical superintendent of the bridge construction work at the control pulpit. In the background a spinning "jenny" of the haulage cable may be seen

Goodwill Building + + +

["With public sentiment nothing can fail; without it nothing can succeed; consequently he who moulds public sentiment goes deeper than he who enacts statutes or pronounces decisions."—Lincoln.]

Maintaining Satisfactory Street Lighting Service

10 The public seems to be vitally concerned regarding the street lighting service in their respective neighborhoods and for obvious reasons like to see them properly lit up each and every night. Other than serving as a protection to the neighborhood and as an aid to the motorist and pedestrian, it is highly desirable from an operating standpoint also that they render as close to 100 per cent service as possible.

I would suggest that self-addressed and stamped postal cards be printed for "Street Light Complaints" listing the various types of troubles commonly experienced and providing blank spaces for checking same. It may also be necessary to add, "DO NOT USE complaint card for troubles other than those listed.

These cards, perhaps several at a time, can be left with a consumer at various locations. When their last card has been mailed in to the company office, it should so state, and when the immediate repairs are followed up, new cards can be left, and a voice of appreciation expressed to the consumer who has given the assistance. This personal contact occasionally with the consumers and the new interest taken to render a more efficient service, besides creating goodwill, would provide a ready index to street light complaints.—*R. C. B.*

●

Goodwill Is Won When Service Excels

11 When a customer enters an office of a public utility and signs an application for electricity, what does he expect to receive? Does he merely expect to have the electricity cut into his home, or to the motor, or to whatever the connection for which he applied? No—the customer expects to receive service, continuous, dependable, adequate service. Service in the true meaning of the word, that service which labors for the interests of others, which confers an advantage and which benefits. Business profits by the extremes of service. It is in the very nature of business, it exists, is sustained and permitted only on the strength of its service.

Therefore, I say that the outstanding factor towards the building of customer goodwill, is SERVICE. Some will say that it is the employee's attitude towards the public, for if the cashier, bookkeeper, meter-reader, trouble shooter, or any employee is discourteous and fail in their duty, the company through this employee is not rendering good service. No small section of the public bases its attitude toward this industry on the words or manner of one employee, therefore the entire personnel should embody and express the spirit of service in all its relations and contacts with the public.

The obligations of the public utilities should not rest with the sale of electricity, but should be concerned with developing that electricity into electrical service. Electric service reaches its fruition when it does its full measure of useful work. The mere sale of an appliance should not be the only goal, but we should have a continued interest in its satisfactory use. Extra courtesy before and after a sale, and proper adjustment in case of any real or fancied dissatisfaction, these are the things that will keep any business growing.

Service conscientiously rendered knows no days work. We must be ready and anxious at all times, to give to our customers, not merely things for which they pay, but individual courteous attention, and more than they demand. The welfare of this industry, as well as the welfare of every employee connected with it, depends on service, and the ultimate goal—customer saitsfaction—can only be achieved by conscientiously and consistently rendering good service. —*A. C. E.*

Rules

TO intensify interest in the problem of building customer goodwill ELECTRICAL WEST will pay $2.50 for each idea or suggestion deemed worthy of publication. In addition all suggestions received during the period from November 1, 1935 to October 1, 1936, will be eligible for $50 in awards to be given by ELECTRICAL WEST, the P.C.E.A. and the Northwest Electric Light & Power Assn. These awards will be based upon the goodwill building merit of the idea, its practicability, adaptability and originality. The judges will be officers of the two associations and the editors. The awards will be $25, $15 and $10 for the three suggestions ranked first, second and third by the judges. In the case of ties duplicate awards will be made.

Suggestions should be limited to 400 words, preferably less. Composition does not matter as manuscripts will be edited for publication by the editors. Ideas will be published over a nom de plume, provided the author indicates that such is his or her wish. They should be sent to the editor.

●

Making Customer Contacts Pay Real Dividends

12 When a civil suit results in a judgment for the plaintiff, it is frequently customary for the defendant to file an appeal or follow other legal procedure equally expensive, in an effort to delay, if not completely avoid, final execution of the judgment. However, had the defendant employed suitable counsel at the outset, the trouble and expense in the defense might have easily been avoided.

Electric utilities are today defendants in the court of public opinion. Final judgment, while not yet publicly announced, might well be unfavorable to utilities, if some of the more prominent jurymen are permitted to domineer the jury. There are many jurymen, however, who have not yet made up their minds, and there is still hope of acquittal, provided the defense can present the facts so that the average juryman can understand and believe them to be facts.

In the meantime "Goodwill Contacts" has become the order of the day. Utilities are leaning heavily upon employees to perform this very important work. This is as it should be; but progress is too slow and actual results far to uncertain.

As an example: Employee Brown, in the course of routine work, meets Customer Jones. "Good fellow, Brown," thinks Jones. "But just a corporation slave." So they exchange friendly greetings, talk about the weather, arrange for a week-end fishing or hunting trip, and go their respective ways. But Employee Brown reports a customer

contact with Customer Jones in the column headed "Friendly."

The truth is, Jones thinks the company Brown works for ought to have a kick in the pants. He is therefore inclined to applaud, secretly at least, the attacks of some demagogic head-hunter; feeling in doing so that Brown could probably do as well for himself working for a publicly-owned power system as he does his present connections. Thereupon Customer Jones renders judgment, casting his vote in favor of public ownership.

Yet all this might have been avoided had competent counsel (high grade public contact men) been employed at the outset. To be sure, there are such men in the industry; but they have a vast array of other "must" duties. Public relations are side-tracked or delegated to other employees whose qualifications, and therefore abilities, prevent the company from getting full value from the contacts.

With management crying for more and more contacts, isn't it possible that too much stress is being laid on the number of contacts and not enough on the quality and on the actual results obtained?

It has been jokingly said that some large corporations would rather spend $100,000 to get them out of jail than to pay $10,000 for sound advice to prevent them from getting in.

Money spent in salaries for high grade public contact employees is good insurance against destruction by a misinformed jury of public opinion.—*Jay Bee.*

•

Employees Can Make Goodwill Suggestions

13 To build goodwill it is important that the utilities find out what their employees and the public are thinking and saying about them; then to make every effort to wipe out any feelings of ill will that may be brought to their attention. Both of these viewpoints no doubt could be obtained by setting up in every main and branch office, substation, etc., an Employees' Suggestion Box, and issuing a circular letter to all employees, inviting them to write in suggestions, criticisms they may have heard, anything they believe would be of interest to their company in bettering its relations both with its employees and with the public. As employees writing in such letters would be reluctant to sign their names, they should be permitted to use a nom de plume.

A disgruntled employee must talk to someone, and he can in a few minutes tear down goodwill that has required months to build. Perhaps his grievance is real; more often, not so real; but so long as any employee feels he has a grievance, he is not likely to praise the company that employs him.

How much better it would be to give the employees an opportunity to talk to their employers in the above manner, rather than to have even a small minority voicing dissatisfaction to the public, which so often lends a willing ear and repeats without investigating to learn the facts.

On the other hand many satisfied employees would like to tell the boss things they have heard, but are reluctant to do so. When the suggestion box is used, there will be no reason to hesitate. Occasionally the utilities could notify their employees which suggestions have been acted upon, and the results obtained.—*C.A.G.*

•

Winning Goodwill by Contrast via Movies

14 A Mickey Mouse movie to gain goodwill for the electrical industry! Show first an old-fashioned house, using whatever equipment was in vogue during the "Gay (?) Nineties." A weary housewife, Minnie, stands perspiring over a hot range preparing the meals. Washday shows her bending over the tubs, using a scrub board to wash heavy articles. An ironing board propped up on two chairs, old-fashioned irons heated on top of the hot range, a bit of wax tied up in a cloth—these comprise her ironing equipment.

Cleaning day finds Minnie scattering bits of wet newspaper over the carpets, to catch some of the dust that will be raised when Minnie starts wielding the back-breaking broom.

Coal oil lamps used for lighting need cleaning and refilling every morning, and the lamp chimneys have to be washed and polished.

Night time finds Minnie wrapping stove lids and hot bricks (removed from the oven) in papers and flannels, to serve as foot warmers.

Around 2 a.m. Mickey is awakened by a familiar howl; he lights a candle, goes downstairs and starts the fire to warm Junior's bottle.

Now let us turn to present-day Mickey and Minnie. A modest home, but completely equipped with modern electrical appliances. An electric alarm clock awakens Minnie, who presses a button to turn on the electrically controlled furnace. An automatic water heater furnishes ample hot water for the whole family. Mickey shaves with an electric razor.

The Mickey children help prepare breakfast, using a fine automatic toaster, etc.

Washday finds Minnie improving her mind, reading the papers while sitting beside the washing machine. An automatic ironer runs so smoothly it can be operated by the 14-year-old Minnie Jr.

Baking day finds Minnie mixing cheese souffle, etc., with an electric mixer. She prepares dinner early in the day, places it in the automatic oven and goes forth to matinee, feeling confident everything will be done to a turn and ready to serve shortly after she returns.

Cleaning day has become a pleasure. The vacuum cleaner raises no dust and is so easy to run, a child can operate it.

As darkness approaches, Minnie presses a few buttons and the house is flooded with light. I. E. S. lamps are placed where the children study and where Mickey sits to read the evening paper. A flood light shows off the garden. An electrically lighted house number shows where the Mickey family lives.

Bed time finds Minnie plugging in the electric heating pads to insure against cold feet. An electric bottle warmer beside the bed will take care of Junior's 2 a.m. meal.

And Mickey knows he can relax completely while listening to the electric bedside radio.

Possibly the foregoing ideas could also be applied to department store exhibits and to the larger show windows. The object is to gain Goodwill for the industry by contrasting the present-day electrical conveniences with the drudgery of the old-fashioned methods, and by showing how cheap electricity is.

—*C. A. G.*

•

Employee—Management Relationship Will Build Goodwill

15 Employee-management relationship should be built not alone upon the foundation of a vital need for each other, but upon mutual understanding and mutual respect. One public service corporation is fortunate in having had for many years a general manager who possesses remarkable ability in remembering people and names. It is a point with him to not only call all employees by their first name but to remember some personal detail of the employee or his family.

In more than twenty years there has never been anything of a serious controversial nature between the two thousand employees of this company and the management.—*R. V. P.*

With the Trade Associations + + +

[An Exchange of Plans and Ideas for Assisting the Industry in All Branches to Solve Some of Its Problems of Trade Relations and Business Ethics]

Markets and Ethics

TWO features of the annual winter meeting of the Pacific Division, N.E.W.A., at Hotel Del Monte, Calif., February 13-15, 1936, with a registration in excess of 100, were outstanding; one a session in which mutual problems of the wholesaler and manufacturer were presented by the Ben Franklin Electric Club of Northern California and the second a session in which utility leaders of the Pacific Coast discussed intimate problems of the power companies as they affect the wholesalers and other branches of the industry.

Aims and ideals of the newly organized group of manufacturers and agents in northern California who comprise the Ben Franklin Electric Club were discussed by W. W. Glosser, president of the club, who served as chairman of the meeting sponsored by this group. At this session George W. "Doc" Allison of the Edison Electric Institute outlined the opportunities in the new national kitchen modernization program. Cooperation from the wholesalers in the formation of local bureaus, he urged, and emphasized the tendency toward ensemble selling.

Business responsibilities in relation to politics were outlined by F. T. Letchfield, vice-president in charge of Industrial relations, Wells Fargo Bank & Union Trust Co., San Francisco and C. R. Knight director of the industrial section of the California State Chamber of Commerce.

George Gadsby, president of the Utah Power & Light Co., Salt Lake, said, "we invite you as never before, with a clarity and sincerity as never before, to join in a coordinated effort to capitalize on the electrical industry's new opportunities." R. E. Fisher, vice-president in charge of public relations and sales, Pacific Gas and Electric Co., San Francisco, paid a tribute to the Pacific Division of N.E.W.A. for maintaining for 27 years an open forum for cooperative endeavor. He pointed to the recent government threat to disrupt the established channels of appliance distribution through direct factory purchases by cooperatives formed under the REA, and asked that action to prevent such tactics be taken.

Fred Todt, Los Angeles district manager G-E Supply Corp., described the recently organized Electrical Development League of Southern California formed by all branches of the industry to aid in the disposal of power from Boulder Dam. Intensive sales promotional programs are in the making, he said. W. L. Frost, vice-president in charge of sales, Southern California Edison Co., Los Angeles, showed the magnitude of this marketing problem.

Cooperative sales programs in northern California for 1935 were outlined by H. M. Crawford, general sales manager of the Pacific Gas and Electric Co. He pointed to a $23,000,000 electrical market as the goal set for his company and the 1600 electrical dealers in its territory. A responsibility which the wholesalers must share, he declared, is in the education of the 5,000 dealers' salesmen who must do this job.

How one utility has made an ally of the wholesalers' salesman was explained by A. E. Holloway, vice-president and commercial manager of the San Diego Consolidated Gas and Electric Co. He told of frequent meetings sponsored by the utility to which all wholesalers' salesmen are invited at which detailed explanations of rates, policies and problems of the utility are made.

Appliance market opportunities in which the wholesalers will participate in the Pacific Coast states as a result of utility promotional and sales activities were described by L. W. Brainard, general sales manager, Idaho Power Co., Boise and George C. Tenney, editor *Electrical West*.

Speaking of the wholesalers' opportunities in participating in this business, Mr. Brainard declared: "Too often the utility sales manager gets a call from a dealer who has been contacted by an uninformed wholesaler's salesman who tells the dealer what so-and-so utility is doing. Every utility cannot underwrite every promotional plan. Find out the facts about the plan for your territory and then help the dealers capitalize on its good points. Don't carry misleading tales."

J. A. Kahn, Intermountain district manager, G-E Supply Corp., surveyed 30 utility and industrial purchasing agents for constructive criticisms of practices and policies with surprising results. Delivery, stock maintenance, lack of salesmanship, too many back orders and salesmen's lack of knowledge of stocks were points brought out.

Glen L. Jackson, vice-president and commercial manager of the California, Oregon and Mountain States Power Companies, presented a paper on unethical competition from the standpoint of the wholesalers' customers based upon a field survey in his territory. Stress of depressed business conditions accounts for emergency policies and practices which have been permitted to become permanent despite the definite improvement in business, he pointed out. Many of the corrective measures must be applied by the wholesalers themselves in his opinion.

Marvin H. Jankelson, Incandescent Supply Co., San Francisco, was elected chairman of the division for the fiscal year beginning July 1, 1936, to succeed Ross Hartley, president, Electric Corp., Los Angeles. Albert H. Elliot was reelected secretary. The next meeting of the division was set for Del Monte, June 11-13, 1936.

In the golf tournament the traditional Copper Cup was won by Allen Phillips, Incandescent Supply Co., San Francisco; the Roscoe Oakes trophy went permanently to Charles Glendennin, Pacific Coast manager, National Carbon Co. for the third win; the manufacturers' cup was won by Arthur Johnson, S & M Lamp Co., Los Angeles, and the central station trophy was won by A. C. McMicken, general sales manager, Portland General Electric Co., Portland, Ore.

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Alameda County Assn. Reduces Staff and Work

Reduction of the staff and activities of the Electrical Contractors Assn. of Alameda and Contra Costa Counties was announced by President Frank E. Boyd, Pacific Electric Motor Co., shortly after the first of the year. The office of the association in the Builders Exchange was closed and the employment of its executive secretary, George

Eldridge, discontinued. Likewise, the Thursday night meetings were abandoned and regular meetings are now held every Friday noon at the Athens Club.

Dan Bronson, California Electric Co., Ltd., was named secretary and the following board of directors were elected: F. E. Boyd, president; William Bernhardt, vice-president; Dan Bronson, secretary; T. L. Rosenberg, treasurer, and William G. Higgins, Fred Schmits and A. R. Matson, directors. Committees were set up to handle the activities formerly carried on through the executive secretary. Mr. Eldridge has become affiliated with the Biddle Trade Bureau, San Francisco office.

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Labor, Supplies and Competition Discussed by Contractors

ALWAYS individualists, electrical contractors of northern California redeclared their independence at the second quarterly meeting of the Electrical Contractors Assn. of Northern California held under the administration of Charles A. Langlais, at Hotel Californian, Fresno, Feb. 21 and 22. Despite the heaviest rain in years, a record attendance of contractors only distinguished the convention. Settling right down to business from the beginning, at an after dinner meeting Friday evening, the convention went off in record style without frivolities or entertainment and concluded at 4 p.m. Saturday.

Friday evening's session was an informal one, yet it formed the background for the formal meeting the next day. Frank and penetrating discussions of the problems concerning labor, supplies, and competitive practices, occupied the delegates until nearly midnight. An outcome of the discussion was a committee which formulated a labor policy for the various local associations affiliated with this Northern California Chapter, National Electrical Contractors Assn. This policy sets forth the effect of individual labor agreements in one locality upon neighboring localities, suggests that any changes in hours, wages and working conditions be conducted in conjunction with representative employers of other related crafts to promote uniformity of hours and starting time, recommends return to the 8-hour day because of the growing shortage of skilled labor, and urges that individual association dealings with individual locals of the labor organization be discouraged.

Coordination of the various subcontractor crafts, which began under the NRA codes, was described by Mano Zan, coordinator for the State Contractors License Bureau. A resolution was later adopted thanking the State Contractors License Board for its effort and particularly the work of Mr. Zan as a coordinator between the various subcrafts.

Glenn Slater, assistant registrar of the Contractors Board, in describing the enforcement of the law, made some interesting comments as to the proportion of electrical contractors to other types of contractors registered among the 23,000 licensed contractors in the state. Figures show that there is one electrical contractor to every five of all the other types of subcontractors. He also expressed a hope that the law would be amended to call for prequalifying of applicants for a contractor's license. Copies of the Register of Contractors, he said, were available to every association and asked what further service the Bureau could render contractors.

In a strong declaration of contractor independence Frank Boyd, Pacific Electric Motor Co., Oakland, demanded that contractors be realistic as to industry cooperative movements and not be absorbed into high sounding but unprofitable programs. He urged that the test of profitability be put on every transaction and illustrated the need for such an attitude by an analysis from Dun & Bradstreet on a number of successful and unsuccessful electrical contracting businesses.

Lloyd Flatland, Globe Electric Works, San Francisco, called attention to the growing competition between contractors and wholesalers and urged that contractors in self-defense buy wherever their best interests were served, even to doing mass purchasing, until the national association is able to inform members of satisfactory changes in policy derived from conferences between the national association and that of manufacturers and wholesalers.

Oliver Larson, of the Charles R. Hadley Co., gave a detailed and understandable survey of the social security act and the type of accounting which must be carried on by individual contractors to comply with the law.

H. H. Courtright, Valley Electrical Supply Co., Fresno, reported on a constructive change in attitude on the part of the local electrical union. He described its activities as embracing the employment of a representative, almost a salesman, to call on prospective builders and sell the idea of having the work done by union labor. He described the work of the union with local builders and with the chamber of commerce along constructive lines.

Edward Martin, Sterling Electric Co., San Francisco, gave a strong discussion of the effect on contractor business resulting from government ownership. He pointed out that the contractor was serving his own interests best by opposing the entry of government more and more into business. In answer to an objection from one contractor on the floor that utilities had given him very little business but that the city had given him much more, Frank Boyd reemphasized that the contractor who opposed government ownership was serving his own interests, whether he liked the power company or not.

Discussion then followed as to the Rural Electrification Administration's proposed sale of wiring materials and appliances to farmer cooperatives which would eliminate contractors, dealers and wholesalers. This was pointed out as an example of government's entry into private business of the contractor type. A strong resolution condemning such a move was adopted.

Mr. Flatland, executive committeeman, explained the delay which had prevented President Earl Peak, of the N.E.C.A., from attending the meeting and promised a visit to the region from him about the first of May. A tentative date for the next quarterly meeting to conform with Mr. Peak's arrival was set for about the first of May. Sacramento was selected as the place for the next meeting, but because of the fine attention to business at the Fresno meeting it was decided that no boat ride or other entertainment be programmed at that meeting. Fresno contractors were highly commended for the publicity they gave to the meeting and for their courtesies to all who attended.

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• AN ASSOCIATION OF ELECTRICAL LEAGUES was finally effected at an organization meeting held in Washington, D. C., in January. The organization takes the place of the former Electrical League Council which had been operated under the Society for Electrical Development. Articles of organization and confederation were adopted and the country divided into five divisions, four in the United States and one in Canada. Arizona, California, Idaho, Nevada, Oregon, Utah and Washington leagues or societies would come in division 4.

EDITORIAL + + +

Lost Ground on Wiring

NEVER has there been more convincing proof of the statement that to stand still is to slip backwards than in the situation respecting wiring and the Red Seal Plan. Wherever the effort has been continuous even in the face of lessened building volume, the idea is still carrying on, and the number of homes that are being wired today are proportionally higher in percentage with Red Seal wiring.

But where the activity was all but abandoned, what a different picture! In California, with the curtailment of the Pacific Coast Electrical Bureau field activity, nothing remained of Red Seal but the idea and the name. The Bureau continued to advertise the need for Red Seal wiring in publications reaching consumers and architects and builders. But field work with the electrical contractors ceased.

Just the other day, because Pacific Gas and Electric Co. has put Red Seal plan promotion back into its sales program, one of its salesmen talked the owner of a new home into a Red Seal job. He was not hard to sell, for he still had heard about it. The builder next had to be reached, and he more reluctantly agreed to advance the wiring to Red Seal standard. But the electrical contractor, even though he already had the job safely past competition, and was wiring the house in the rough, could not be sold. It would disrupt his circuit arrangement.

Editor Sam Williams, in *Electrical Contracting*, makes the disquieting indictment that the industry does not know how to sell electrical wiring, that the public does not consciously want more wiring, that architects and builders refuse to sell it for the industry, and that in no other business does the industry expect the retailer, (in this case the contractor) to do all the selling and to create demand. The Pacific Coast Electrical Association has recognized the growing threat to increase loads with which the choked avenues of electrical service—wiring—confront the industry and has made the subject one for problem paper treatment.

But the ugly fact remains that the industry itself is not sold on adequate wiring. The contractor just mentioned is but one of thousands who are blind both to the needs of the public and of the opportunities for themselves. Every day the editors hear unbelievable accounts of homes built by people in the industry who put more money into a shower bath than in the entire electrical equipment for their home, of others who install bare bulb lighting fixtures, of others who buy a fuel range instead of electric, of vice presidents who like to chop ice with an ice pick, of hundreds who should know better complaining of high rates in a territory where rates are lowest in the world.

The Electrical Development League of Southern California evidently has recognized this "backwoods" condition of the electrical people themselves and is preparing as its first big job that of selling electricity back to the electricians. This was a program which the industry thought it had accomplished some years ago, and hence relaxed its efforts. Promotional funds dropped off and the industry and its people were left to coast on the momentum of past effort. For the last few years the coasting has been down hill in reverse.

Like charity, electric wiring convenience begins at home.

Help on the Firing Line

"THERE are 5,000 men and women in our territory selling electrical appliances. Most of them are woefully ignorant of the rudiments of salesmanship and few if any know the rates, policies or service facilities of my company, which, after all, furnishes the electricity which makes the appliances they sell useful to the customer." When a power company sales manager made this statement before a group of electrical men recently, he pointed to the weak link in the electrical industry's sales chain—the man or woman on the firing line. Improve the sales ability of this group and acquaint them with the vital phases of the industry that affects their jobs, and the sales and profits of every branch of the industry would mount.

How this can be done presents a problem. Obviously the responsibility rests jointly with the power companies, the manufacturers and the appliance distributors or wholesalers. Undoubtedly a coordination of the sporadic individual efforts now in vogue would help. Many of the maufacturers offer correspondence courses in salesmanship to their dealers' sales forces. Could these not include references to the utilities and their problems, rates and services? Some distributors conduct sales classes for dealers' salesmen. By including a representative of the local power company on the program, these people could be given valuable information. One power company

makes every effort to utilize the wholesalers' salesmen. It holds periodic meetings for the men covering the dealers in its territory at which its own sales program, rates and services are explained fully. Another distributor invites a power company sales department representative to every dealer meeting it holds. One cooperative industry sales promotion organization is preparing a handbook for distribution to all sales people in its territory.

With a crying need for closer contact with these men and women who must do the big selling job, the industry can well afford to take the necessary steps to make their efforts more productive and effective. If a complete program cannot be worked out, then some adaptation of the plans now used will pay dividends.

Once More—The "Wholesale" Evil

APPLIANCE manufacturers have received letters from rural cooperatives at the instigation of the Rural Electric Administration seeking direct factory "wholesale" deals on appliances for their members. This should be the signal for action by wholesalers and retailers before the practice is permitted to spread.

Here in the West the industry has had experience with such deals, whereby irrigation district members purchased everything from wiring supplies to appliances at cost. The trade in some districts still suffers from the effects of those experiments. The ultimate effects of such a national program is outlined in the following resolution passed by the wholesalers:

"Whereas the wholesaling and retailing branches of the electrical industry provide employment and livelihood for thousands of men and women through the distribution and sale of electrical appliances, and

"Whereas these businesses represent a tangible investment in money and experience that is an essential part of the American business community, and

"Whereas the wholesaling and retailing branches by their promotional advertising and sales efforts provide a vital service in the distribution of electrical appliances which has resulted in unprecedented growth in the use of labor-saving and comfort-giving devices by the public, and

"Whereas the employment and livelihood of thousands of employees and the security of invested capital is seriously menaced by the announced policy of the Rural Electric Administration to foster the direct purchase of these applianecs from manufacturers by cooperative agencies, and

"Whereas such a policy would not only destroy established lines of distribution but would establish dangerous precedents which ultimately would result in more unemployment, confusion and hardships, and

"Whereas such a policy would definitely retard essential business recovery by restricting rather than expanding the volume of business through established distribution channels, now therefore,

"Be it resolved that the Pacific Division of the National Electrical Wholesalers Association, in convention assembled at Del Monte, February 14, do hereby petition and urge the R.E.A. and its various agencies to desist from the practice or proposed practice and recognize the regular channels of distribution, with the earnest assurance on the part of the wholesalers that they will lend full assistance to any cooperative effort to promote the sale and use of electrical appliances which will recognize these established channels of distribution."

Concerted effort might yet forestall the extension of this practice. Other organizations can well afford to seek relief by addressing similar resolutions to congressmen and senators in Washington.

Still on a Rubber Standard

LIKE a touchdown in the last second of a scoreless football game, the Supreme Court decision on the TVA came only at the end of a long drawn out battle and after the spectators had become restless to know the final score. To the experts, the outcome was not a surprise. Some let hopes, sentiment and loyalty influence judgment, just as loyal alumni do when their alma mater goes on the field in its annual big game.

The case brought out little that was new. It was as if the touchdown had been made possible by an interpretation of the rules by a football official who missed part of the play. The spectators are left in doubt as to the merits of either side. The TVA decision is no less satisfactory because it leaves a larger crop of if's, and's and but's hanging on the tree than it harvested therefrom.

In the meantime the eventual outcome of the many sided disputes over the "Norris Nightmare," conceived in war, erected on socialism and dedicated to the belief that politicians are honorable, remains unsettled. Other cases undoubtedly will come before the court for constitutional tests as to the legality of the TVA principle.

The present decision did not say that TVA is constitutional or that the government can build dams and transmission lines willy-nilly. It did not countenance competition with the private utilities nor was any issue involving confiscation at issue.

The business of the electrical industry will go on as usual. For the moment the government can continue to say, like a Hoosier schoolmaster, to the power companies, "Take down your rates for I am going to whale the tar out of you with this nice rubber ruler."

Significant Trends + + +

[Signposts which point the road to improved business or method, brief, pertinent, useful hints as to HOW someone has blazed a new trail]

County Inspection Hard Where Manpower is Cut

CONDITIONS encountered in county inspection in Orange County, demonstration and discussion of several service equipment assemblies, enforcement of radio interference ordinances, and a number of other inspector problem discussions featured the regular bimonthly meeting of the Southern California Chapter, Southwestern Section, International Assn. of Electrical Inspectors, held late in January at Beverly Hills, Calif. O'Neil Barnwell, superintendent of building of the city of Beverly Hills, was host and Otis Newcomb, electrical inspector, Long Beach, chairman of the chapter, presided. C. T. Coyle, president of the Southwestern Section, of Fresno, was a guest.

Frank McMahon, Pomona, outlined plans for preparation of a permanent exhibit to be used by inspectors at county fairs and other public gatherings to explain the hazards of improper installations. He also spoke on radio interference work in which he had located over 8,000 causes for complaint in 1933, which had dropped to 3,000 in 1934 and has been considerably less ever since.

H. M. Stewart, Southern California Edison Co., J. G. Moyen, Square D Co. and R. C. Stackhouse, Westinghouse Electric & Manufacturing Co., explained the need for complete service equipment assemblies and exhibited samples of the lines manufactured by the latter two companies. Details of construction were discussed by the inspectors present, and suggestions made for improving certain features.

A. H. Veit, county electrical inspector, and V. H. Hartley, managing director, Pacific Coast Electrical Assn., reported on Electrical Development League of Southern California activities and the organization of a Maintenance Engineers Section.

G. E. Price, county electrical inspector, Orange County, led the discussion on inspectors' problems by describing some of the conditions encountered in Orange County. The county combines interior and sea coast localities each with different problems. He pointed out how an inadequate force made inspection difficult in working over an 800 sq. mi. area. Lack of uniformity in the interpretation of regulations, in various towns and cities, each with their own local rules, caused confusion in county areas adjacent to these towns, he declared.

Particularly difficult, he said, were climatic conditions along the coastline where severe corrosion and electrolysis are prevalent. Here he has various types of wiring methods under scrutiny to determine which will best meet the conditions. Failures in metallic raceways on south walls facing the ocean, he said, were evidently due to rapid changes in temperature, causing condensation in the raceways. He observed enameled conduit to last longer than electro-galvanized conduit in the same location. Electric metallic tubing had been found badly corroded at connectors, especially those fastened by means of a crimping tool.

O'Neil Barnwell, of Beverly Hills, told of problems in connection with concealed illumination. Larger spacing, because of the heat, metal enclosure and ventilation to prevent ignition of combustible materials, as well as wiring with heat resisting insulated wire, he declared to be necessary.

On invitation from Mr. McMahon the chapter will hold its next meeting in Pomona, March 25. William McFadden, Beverly Hills electrical inspector, presented a rare old gavel to the chapter for use in its meetings.

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...in Wiring Rules

• PRESIDENCY of the International Assn. of Electrical Inspectors left vacant by the death of the late Claude W. Mitchell, who was to be elevated to the presidency this year, is to be filled from among the membership of the Southwestern Section, according to Victor H. Tousley, secretary-treasurer, I.A.E.I. Decision of the Southwestern Section as to who would succeed Mr. Mitchell for this post had not yet been decided at the time of going to press.

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• THE LOS ANGELES CITY COUNCIL at a recent meeting approved the employment by the Division of Electricity of a full time inspector for the enforcement of the substandard appliance ordinance. Another inspector is to devote half time in the relief of the full time appliance inspector and to assist him in making checks of appliance stocks.

Northwest Inspectors Lay Convention Plans

Tenth annual convention of the Northwestern Section, International Association of Electrical Inspectors, will be held at Olympia, Wash., Sept. 14-16, 1936, according to announcement by F. D. Weber, secretary. Headquarters will be in the Hotel Olympian.

Space in the hotel for manufacturers' exhibits is to be provided and sold at a nominal sum by the association. Space is limited and reservations should be made early, it was declared.

The local entertainment committee has many unique entertainment features in mind, such as a clam and oyster bake, golf, banquet and dinner dance, and trip to various power plants.

The technical program will be of special interest to all attending. The new arrangement of the National Electrical Code will be available and be discussed, as well as the regular committee reports; several papers by prominent men in the industry will also be presented.

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Inspectors Increased by Colorado League Demand

Electrical League of Colorado's energetic crusade to improve wiring adequacy in public and private buildings in Denver was crowned by success when 1936 municipal budgets were announced recently. As a direct result of the League's resolutions, addressed to Mayor Ben F. Stapleton, a new inspector is to be named, supplementing the inadequate force now operating under City Electrician John Malpiede.

The appointee, who has not yet been selected, will relieve Malpiede for much-needed reinspection service.

Reduction in the number of inspectors by the city administration during recent years caused League Manager George Bakewell, Jr. and members of his organization much concern. Wiring standards were necessarily lowered as facilities for enforcing ordinances diminished. When an analysis of the eight-year period, 1927 to 1935 showed that the department operated at a profit averaging $3,810.97 annually, the League went into action. It pointed out to Mayor Stapleton that there appeared no reason why the electrical industry, through the electrical inspection department, should be called upon to contribute more than its pro-rata share of the overhead operation cost of the

Building Department. It also showed that a reduction in the number of inspectors had resulted in very superficial and woefully inadequate inspections, delay in completion of contractors' work, inability to uncover hazardous wiring conditions, and lower standards of workmanship. Demand was made that the surplus accumulated in the electrical inspection department be applied to employing additional inspectors.

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Hotelling on Board for Washington State Code

M. P. Hotelling, for many years electrical inspector with the building department of the city of Seattle, has temporarily severed his connection with that department to accept a position with the State Department of Labor and Industries to aid in organizing the administration of the new state electrical code. His headquarters are in the Seattle office of the department.

Mr. Hotelling started in the electrical business as a wireman in Seattle prior to the war. In 1917 he enlisted in the navy and was assigned to the navy electrical school. He left the service as chief electrician on submarine H-5 and joined the building department of Seattle in 1920.

During most of the past year he served as president of the Northwestern Section, I.A.E. I., and at the convention of that organization in Seattle, Sept., 1935, he was elected president for the current year.

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...in Construction

Revive Red Seal Plan Activity in California

Red Seal wiring will receive concentrated attention in northern California again this year. For some years, during a lull in the construction of homes, the promotion of this plan which meant increased wiring jobs for electrical contractors and more supplies for wholesalers and manufacturers has carried on only on its momentum from former activity. The sales plan of Pacific Gas and Electric Co. in 1936, however, makes it part of the responsibility of 100 to 150 field salesmen of that company to talk and to promote the Red Seal wiring idea for all new homes constructed.

A series of meetings with Frank Kiefer, northern California representative of the Pacific Coast Electrical Bureau, has been held in P. G. and E. offices in San Mateo, San Jose, Salinas, Stockton, Sacramento, Auburn, Napa, Santa Rosa, San Rafael, Red Bluff, Marysville and Chico to acquaint the field salesmen with the Red Seal Plan.

Wholesalers and electrical contractors are being urged to take advantage of the effort which these salesmen will put forth upon Red Seal wiring this year.

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• CORRECTION—An error in the name of the electrical contracting firm doing the installation on the Park St. bridge, as reported in the January issue of ELECTRICAL WEST, page 27, ascribed the work to the "Century Electric Co." The contracting firm was Central Electric Co., of San Francisco.

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• GEORGE FOSS, electrical contractor of Sacramento, recently completed the installation of the new 5,000-watt transmitter and equipment for the *Sacramento Bee* radio station KFBK at Sacramento. The installation included modern lighting and electrical facilities for the studios and reception rooms as well as the transmitter itself. Last year he also wired for new presses and many improvements to the newspaper plant.

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...in the Motor Shop

Why Leave Home?

Editor:

It was undoubtedly a nice piece of business for the United Air Lines, who collected $2,607 in express charges on the coils for the 900 hp. motor belonging to the Diamond Match Co., which you reported in the January issue of ELECTRICAL WEST. This apparently made it possible to get the motor back in service in eight days, which was considered to be a record for speed.

Aside from this unique and unnecessary expenditure there seems to be little in this record to justify devoting a half page of your valuable space to the incident, except that it affords an opportunity to present to your readers a statement of fact that there are on the Pacific Coast motor shops equipped not only to make up the coils to do the unusual winding jobs with real speed, but also which are competent to design windings where changes in characteristics from the original design are necessary.

It would seem to be in order that the public be informed that coils made by competent motor shops, using the same high grade materials, methods and workmanship that the manufacturers use are fully equal to "factory coils"—a term which has too often been used to discredit a comparable product produced locally.

The records are full of cases where real speed jobs have been produced by qualified motor shops. Recently one such shop in Los Angeles was called on to rewind a 700 hp. 2300-volt vertical motor and a 300 hp. 440-volt vertical which had been submerged in the San Jacinto tunnel of the Metropolitan Water District. Within seventy-two hours the motor shop in question had these two motors back on the job. Of course they made up their own coils.

In another case a motor shop was called on to rewind a 900 hp. 2300-volt motor for the Los Angeles Railway. No particular speed was required and yet by normal operation the job was completed in ten days. Also in this case the coils were made by the shop.

Another instance, which was reported in your columns several months ago was the case of the design of motor winding, making and installation of coils and complete assembly and shipment to Honolulu of a 400 hp. eight pole, 2300-volt motor for the Standard Dredging Co., all within seventy-one hours after receipt of order.

Twenty-six hundred and seven dollars would seem to be a pretty stiff penalty to pay for speed which could be obtained in just as satisfactory a manner by less expensive methods.

Yours very truly,
J. O. CASE.
President Southern California Electric Motor Specialists Association.

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...in Lighting

Form Sight Council for Northern California

A Sight Conservation Council in northern California finally took shape at a meeting called at the Oakland High School January 28. Preliminary organization work between school authorities, eye sight specialists and the Pacific Coast Electrical Bureau through Clark Baker, lighting councilor, terminated in the formation of the Sight Conservation Council with definite educational objectives.

The program was presided over by L. P. Farris, principal, Oakland High School. He introduced Dr. R. S. French, principal of the California School of the Blind, who spoke on "The Need for Sight Conservation." A constitution and bylaws were presented by Miss Delight Rice, supervisor of hearing, speech and sight, Department of Education, Berkeley.

Following election of officers and adoption of the constitution a demonstration program was presented. Dr. J. C. Edwards, M.D., of Berkeley, Calif., gave an illustrated talk on "The Anatomy of the Eye." This was followed by an illustrated talk on "The Effect of Light in the Eye," by Dr. Hugh V. Brown, optometrist, assisted by Clark Baker. Next Leland H. Brown, assistant professor of electrical engineering, Stanford University, and Clark Baker presented a demonstration "The Selection of Light." The demonstration program concluded with an explanation and demonstration of "The I.E.S. Study and Reading Lamp," by Leland H. Brown and Clark Baker.

At the meeting Dr. R. S. French, principal, California School of the Blind, was elected president; L. P. Farris, principal of Oakland High School, vice-president; Miss Delight Rice, supervisor, Department of Education, Berkeley, secretary-treasurer; Clark Baker, executive secretary and the following were named to the board of directors: Leo Baisden, Clark Baker,

Albert Boles, M.D., Dr. O. L. Brower, Dr. Leland H. Brown, Charles W. Bursch, John J. Donovan, Dr. J. C. Edwards, L. P. Farris, R. E. Fisher, Dr. R. S. French, C. H. Fry, Leo G. Gianini, E. J. Hardy, H. H. Hicker, Allen G. Jones, Dr. Noel Keys, Dr. Clara Kohls, Dr. William G. Lindsay, Rev. J. Long, Dr. Elizabeth McFadden, Prof. Ralph S. Minor, Dr. Frank R. Missner, Dr. Raymond M. Mosher, Miss Delight Rice, J. R. Sharpsteen, M.D., Mrs. Katherine Sutter, Dr. Percy F. Valetine and Fred J. Wellhouse.

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Western Light Institute Adds Chapters in South

Chapters of The Western Institute of Light and Vision are under way in the Riverside-San Bernardino or Orange Empire district and in the harbor district around Long Beach, according to Frank A. Hansen, director. The Institute is also cooperating closely with the Better Sight-Better Light movement with San Diego and Pasadena.

Orders for about a half million of the pamphlet "Seeing" have been received, with over 200,000 of these delivered to date. A membership plaque had been prepared for those members consisting of eyesight specialists, electrical dealers, lighting men, etc. Speakers committees are organized and a speakers kit is being developed.

A monthly progress report is issued by the secretary to all the members of the Institute giving at a glance a statistical report of number of talks, members, etc. and more detailed information regarding activities.

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Bakersfield Schools First To Be Relighted Adequately

Bakersfield, California, city schools will have the distinction of being first in having an entire school system adequately lighted, according to J. E. Hammond, illuminating engineer, San Joaquin Light & Power Corp. John Walsh, lighting representative in that city, has worked with city school authorities and convinced them of the desirability of saving the eyesight of children. The project contemplates the complete relighting of 172 class rooms, each to be provided with six outlets for totally indirect fixtures of 300-watt capacity. Wiring capacity for 500-watt fixtures is provided. The cost is to be budgeted over a four-year period.

Meanwhile E. W. Conrey in consultation with the architect of the new Gustine school was successful in having approved specifications for six 500-watt totally indirect lighting units in each class room. Mr. Conrey designed the sport lighting at the Gustine field, which proved so successful.

• I. E. S. ANNOUNCES NEW SHADE SPECIFICATIONS—In the interest of the ultimate consumer the Illuminating Engineering Society, through new shade specifications and separate certification of shades, has made it possible to get a choice of shades when purchasing a complete I.E.S. lamp. A separate tag will certify the approved shades. It is expected that the new specifications will improve the general quality of shades since the Society pays regard to mechanical construction and durability.

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...in Engineering

Maintenance Engineers Propose Organization

First steps toward the organization of an association of electrical maintenance engineers in southern California, under the sponsorship of the Electrical Development League of Southern California, were taken recently at a meeting in Los Angeles, of a large group of maintenance engineers. A committee appointed to make a study of the plan for an association is composed of C. M. Hoag, Union Oil Co.; Robert D. Coon, Proctor & Gamble Co.; E. E. Lombard, Bethlehem Steel Co.; Water E. Coburn, Los Angeles Board of Education; D. H. Byl, Union Ice Co.; Charles F. Kimball, Ford Motor Co., and A. F. Michael, Goodyear Tire & Rubber Co.

The maintenance engineers were brought together through the efforts of the industrial committee of the Electrical Development League. The industrial committee includes J. O. Case, Quality Electric Co.; R. H. Cockfield, Los Angeles Bureau of Power and Light; E. M. Ellis, General Electric Co.; George N. Hawley, Southern California Edison Co., and J. M. Morris, Westinghouse Electric & Mfg. Co.

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...in Merchandising

New Cookery Council Officers Elected

Harry F. Echols of the sales staff of Watson and Wilson, Los Angeles, Calif., has been elected president of the Electric Cookery Council of Southern California for the new year. He succeeds Chester H. Dye, head of the appliance sales department of the Los Angeles Bureau of Power and Light.

Mr. Echols took office at a meeting Jan. 14 which was designated as Southern California Edison Co. night. John H. Adams of the Edison Company's merchandising department was chairman. Members of the Edison organization who appeared on the program with Mr. Adams included H. J. Drexel and Harold Moore, sales supervisors, and H. W. Hayes, assistant advertising manager.

Sodium Lighting for Fog Belt

The largest installation of sodium vapor lights in the United States at the present time is the one illuminating three miles of 4-lane highway between Tacoma and Fort Lewis, Wash. The installation consists of sixty-six 10,000-lumen G-E units staggered 200 ft. apart. The installation was made to test the lighting characterisics of this equipment on a section of road made particularly hazardous at times on account of heavy fog

News of Note + + +

Supreme Court Finally Decides TVA Case

After two months of deliberation the United States Supreme Court on February 17 handed down a decision in the TVA case, which, while specifically confined to a single contract relating to the purchase of transmission lines emanating from Wilson Dam, inferentially upheld all power activities so far undertaken by the TVA. Eight of the nine justices concurred on three specific findings: (1) construction of Wilson Dam by the federal government was justified under its war powers and its power to aid navigation; (2) power generated at a dam legally constructed by the federal government is federal property and may be disposed of by congress; (3) government owned transmission lines extending to a fair market for such power are constitutional.

Studiously avoiding decision of any point not vital to the rather narrow case before it, the court indicated that each case dealing with the government's entry in the power business apparently must stand on its own bottom, the essential question being whether some good constitutional excuse can be found for a given operation thereby justifying what the government wants to do. Best legal opinion is that the TVA decision puts the seal of approval on Grand Coulee, Bonneville and Fort Peck projects in the Western states.

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Portland Voters Reject Northwestern Purchase

Voters in Portland decisively turned down the proposal to levy a $50,000 special tax to appraise property of the Northwestern Electric Company of that city looking toward ultimate purchase of that property by the city in accordance with the option to purchase contained in the company's expiring franchise. The proposal came to the voters by reference from the city council at a special state election January 31. The majority was over ten to one against the proposal, complete returns showing 61,265 opposed to 5,853 in favor.

The option in the company's franchise, which expires November, 1937, provides that the city may purchase the company at a value to be arbitrated. The $50,000 fund was to cover the cost of finding the "economic worth and financial value" of the company and the cost of setting a price by arbitration. The measure also provided that final determination of whether or not to purchase the company should be decided at a special eection in February, 1937. The decisive vote against the proposal is interpreted by some to mean that municipal ownership sentiment in Portland is waning.

The following is a direct quotation of editorial comment in the *Portland Oregonian,* Feb. 2, 1936:

"Sponsors of this measure offered it openly as a test of public ownership sentiment in Portland. The election figures, however, probably minimize considerably the strength of that sentiment. The $50,000 expenditure was a bad peg on which to hang the issue, for appraisals already made are available. The proposal nevertheless was revealing of the indifference toward tax-money-spending that commonly prevails among advocates of public ownership. Submission of this wasteful measure to the people undoubtedly opened the eyes of many voters to inherent dangers in public ownership and gave that policy a material setback."

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Pacific Power & Light Rates Are Reduced

Rate reductions aggregating $205,000 and ranging from 5 to 15 per cent have been ordered for the Washington customers of the Pacific Power & Light Co. by the Washington Department of Public Service. The rates become effective March 1.

Residential rates are reduced 9 per cent, power and irrigation rates 5 per cent and commercial lighting rates 15 per cent. The order follows an investigation by the department in which it valued the company's Washington properties at $11,466,600. The new schedules are divided into three classes according to the size of the towns and cities served. In Yakima and Walla Walla, which are included in the first group, the residential rate is $1 for the first 15-kw-hr. per month; 5½ cents for the next 20-kw.-hr.; 3 cents for the next 115-kw.-hr. and all in excess 2 cents. Second and third class rates are slightly higher.

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• CONTRACTS for 15 of the huge contrifugal pumps to be used on the Metropolitan aqueduct in southern California have been awarded by the Metropolitan Water District. Six 12,000-hp. pumps with a total capacity of 90,000 gal. per min. against a total head of 460 ft. will be built by the Worthington Pump and Machinery Corp. Six 8,000-hp. units are to be constructed by the Byron Jackson Co. and three 5,000-hp. units by the Allis-Chalmers Mfg. Co.

Pepco Reorganization Nears Completion

A step in the financial reorganization of Portland Electric Power Co., by which control of that company is definitely placed in the hands of western operators and ultimate ownership will be vested in the preferred stockholders has been effected by Franklin T. Griffith, president. Since 1932 the 175,700 odd shares of common stock owned by Central Public Service Corp. have been in a voting trust agreement, with Mr. Griffith, J. C. Ainsworth, president of the United States National Bank, Portland; and E. B. MacNaughton, president, First National Bank, Portland, as voting trustees.

In the recent move the stock and the voting trust certificates are placed in escrow in the First National Bank, Portland, until November 1, 1942, when the voting trust terminates and ownership of the stock will pass to Portland Electric Power Co. It is Mr. Griffith's intention to cancel and retire the stock at that time, leaving outstanding only the various preferred and prior-preference issues now owned by some 13,000 stockholders, 10,000 of whom reside in Oregon. Most of the preferred stock now votes equally with the common stock and when the common stock is retired sole voting rights will remain with these preferred holders.

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Pend Oreille Project Will Start This Year

Preliminary work on the Pend Oreille hydro electric scheme in southeastern British Columbia will go ahead this year, it was announced at the Legislative Buildings in Victoria, B. C. Commencement of this project by the West Kootenay Power & Light Co. will be the first large power development started in British Columbia since the beginning of the depression. The company's plans as outlined to government officials indicate that it looks forward now to a sharp expansion of industry and a growing need for electricity in the visible future.

The program for this year calls for the removal of the over-burden on the dam site chosen for the development on the Pend Oreille River a short distance from its junction with the Columbia. Before the depression stopped all such expansion, the company had conducted extensive borings to discover a suitable site for a dam which would impound the waters of the Pend Oreille and raise them.

San Francisco Submits Power Plan to Ickes

Officials of the city of San Francisco have proposed to Secretary of the Interior Harold L. Ickes, a plan for the disposal of hydroelectric power from plants on the city's Hetch-Hetchy water supply system. Sale of this power to the Pacific Gas and Electric Co. under the "temporary" contract which has been in effect for approximately ten years was recently ruled by the secretary to be a violation of the Raker Act, which granted the city authority to utilize government land in the Hetch-Hetchy development.

In brief, the plan proposed by the city is as follows:

1. Operation by the city of the Hetch-Hetchy power plants as at present.
2. No change in the status of the 98-mile transmission line connecting these plants with the P. G. & E. system at Newark.
3. Sale of all energy to P. G. & E. at Newark, as at present, at a 75% load factor.
4. Repurchase of the same amount of energy, but at 43% load factor at P. G. & E. substations in San Francisco. The sums involved in the sale and purchase are identical. The city contends that it would thus regain ownership of all firm power, leaving 205 million kw.-hr. of secondary power per year with the company as compensation for the use of its transmission lines and substations, and for stand-by service.
5. Purchase by the city of part of P. G. & E.'s distribution system in San Francisco. The section to be acquired would be in a solid block covering about half its area and containing two-thirds of its population.

Figures submitted with the plan estimated that the city could reduce retail rates in the area served 10 per cent, pay 4 per cent interest and amortization charges on the $18,600,000 bond issue required and meet operating expenses with an annual surplus of about $1,000,000. It is contended that wasteful duplication of facilities, specifically transmission lines and a steam stand-by plant costing about $9,000,000, will be rendered unnecessary by the proposed arrangement and that the best interests of the people of San Francisco will be served. The secondary power which it is proposed to turn over to P. G. & E. could not be utilized by the city in any event, and must be wasted unless used to pay for the use of company facilities.

While the city admits that the sale of any power to a private utility for resale is forbidden by the Raker Act, it contends that the plan comprises "reasonable" compliance within the discretion of the secretary's approval. It is further contended that the purpose of the act is to protect the interests of the people of San Francisco and that this purpose would not be served by compelling the city to increase its investment by building duplicate facilities and at the same time compelling the waste of secondary power.

San Francisco has no agreement with P. G. & E. indicating acceptance of the plan.

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Nevada-California Electric To Dissolve Subsidiaries

Simplification of its corporate structure to conform to the spirit and purpose of the National Public Utility Act of 1935 is indicated in a petition filed by the Nevada-California Electric Corp. with the California State Railroad Commission seeking to transfer $40,000,000 of electric properties of various subsidiaries to the parent companies.

Nevada-California Electric Corp., which heretofore was operated as a holding company, will become an operating concern and the various subsidiary companies will be dissolved. The petition involves the Southern Sierras Power Co., the Nevada-California Power Co., the Hillside Water Co., the Cain Irrigation Co., and the Yuma Utilities Co.

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Work Starts on Line For Water District

Construction of the Boulder Dam transmission line of the Metropolitan Water District Colorado River aqueduct project was begun Feb. 1. The 237-mile, 230,000-volt line, which ultimately will carry thirty-six per cent of the electrical energy generated at the Boulder Dam plants, will run south from the dam in the form of an inverted "Y" connecting with the five pumping plants on the Colorado River aqueduct.

Work on the transmission line phase of the aqueduct project is being done by Fritz Ziebarth, Long Beach contractor, under the direction of F. E. Weymouth, general manager, and James M. Gaylord, chief electrical engineer of the water district.

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• ELECTRIC AND GAS construction budgets of the Pacific Gas and Electric Co. for 1936 total $16,510,075 according to a recent announcement by P. M. Downing, vice-president and general manager. The construction work planned includes extensions, replacements and additions in all departments. In addition $24,396,598 has been budgeted for maintenance and operation.

L. T. Merwin Elected Head Of Northwestern Electric

L. T. Merwin, for the past fifteen years vice-president and general manager of Northwestern Electric Co., was elected president of that company at a meeting of the board Feb. 13. Paul B. McKee, former president, resigned in deference to the amended provisions of th Federal Water Power Act, effective Feb. 26, which regulates the holding of office or serving as a director in more than one inter-state electric company. Mr. McKee retains the presidencies of Portland Gas & Coke Co. and Pacific Power & Light Co.

Mr. Merwin graduated from the University of California as an electrical engineer in 1895. He entered the electrical business as a sub-station operator for the San Joaquin Power & Light Corp. 35 years ago. He came to Portland in 1912 when the Northwestern Electric Co. was being built by the Fleishhacker interests, his first job being supervisor of construction of the transmission line from the Condit plant on the White Salmon River to Portland. Later he served as operating engineer, general superintendent and assistant general manager and was made vice-president and general manager in 1920.

Mr. Merwin has been active in civic affairs in Portland, his principal interests being in the Chamber of Commerce, East Side Commercial Club, Rotary and Community Chest. He is a member of the A. I. E. E. and is the immediate past president of Professional Engineers of Oregon. He has also been active for many years in the Northwest Electric Light & Power Association acting on the committee which re-organized that association after the dissolution of the N. E. L. A. and serving as its president in 1933-34.

Also deferring to the same federal statute, John A. Laing, vice-president and general attorney for the three affiliated companies in Portland, resigned as a member of the board of Pacific Power & Light Co., a position he has held for 25 years. He retains his position on the boards of Northwestern Electric Co. and Portland Gas & Coke Co. At the same time he formed with his associate Henry S. Gray the law firm of Laing & Gray to engage in the general practice of law in their offices in the Public Service Building. Laing & Gray will continue to serve as legal advisers of the three companies.

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• GUY FARWELL, of Sterling Furniture Co., was elected president of the San Francisco unit, Electrical Appliance Society of Northern California, at its annual meeting Jan. 7. Eli Popovitch, manager of the electrical appliance de-

Power Districts Seek Lower Wholesale Rates

An attempt to obtain reductions in the wholesale power rates charged by the four major power companies operating in Washington has been initiated by the state Grange in a formal complaint filed with the state department of public works. The complaint contends that existing wholesale rates are blocking expansion of rural electrification.

Four Grange districts are parties to the complaint, having been organized under the provisions of the state power act passed by initiative in 1930. They are located in Benton, Franklin, Spokane and Mason Counties. In addition to these there are farmer cooperatives in Grays Harbor region. All of these districts are hopeful of receiving federal aid under the R.E.A. They charge that the private companies' rates are in excess of those charged by the Tacoma and Seattle municipal systems for similar wholesale service.

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Organize Ben Franklin Club in San Francisco

Manufacturers and manufacturers' agents in northern California have organized the Ben Franklin Electric Club for the purpose of promoting understanding and harmony with the electrical wholesaling group in the handling of mutual problems. Membership is confined to individuals connected with firms whose major business follows the manufacturer - wholesaler - dealer-consumer channel of distribution.

Officers of the organization include W. W. Glosser, vice-president in charge of Pacific Coast operations, Hubbard & Co., president; H. H. Benfield, Steel and Tubes, vice-president; Chas. B. Clendenen, National Carbon Co., vice-president; and A. W. Rockwell, Appleton Electric Co., secretary-treasurer.

A similar organization has been operating in southern California with great success for the past year.

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• CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena, has announced the award of a contract to the Westinghouse Electric & Manufacturing Co. for construction of the mechanical parts of the 200-inch astronomical telescope to be erected on Palomar Mountain, San Diego County. The telescope tube, to be 55 ft. long, 24 ft. in diameter at the base, will weigh 850 tons. The construction of the mounting, designed by the California Institute and Mt. Wilson Observatory staffs, will follow the design of a working model, one-tenth of actual size, now being built at the California Institute workshops.

The Standard News

March, 1936 — Electrical Edition

Published by THE STANDARD ELECTRIC STOVE CO., Toledo, Ohio

Editorial

Have you ever noticed the lack of extravagant claims in Standard advertising? The urge sometimes becomes very great, especially when we read that such and such is so many percent faster, more efficient and so on.

It has always appeared to us to be the best policy to state just exactly what we can do and then do it. A good thing to remember is—"Do not mistake activity for achievement." We do not know who said that but it has a lot of meat in it. Reviewing the past always smacks of being in your dotage, but inasmuch as the oldest one here hasn't yet reached the half century mark, we cannot accurately be accused of that.

But we do like to read over the 1912 literature sometimes and compare it with present day stuff. Listen to this written in 1912—"Functions of the clock:—a means whereby the heat needed to cook can be accurately measured and automatically regulated. It provides a great convenience to the user. Wishing to make coffee, the user moves the hand of the clock to the numeral 10; thus set for 10 minutes, the coffee comes to a boil and the current shuts off."

It took a lot of vision and initiative in those days to propose some of the things that Standard did. But it apparently paid, as evidenced by the fact that Standard is still here making up-to-the-minute ranges.

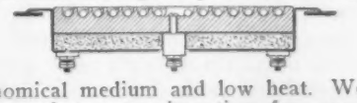
C. A. P.

Kalmax

Kalmax burners cost no more than open type SPEED-HEET. Just specify how many you want on each range. Kalmax is the improved new Standard enclosed burner with these features—Flat surface which fits utensil snugly, losing no heat; Quick heating—the wires are not embedded nor surrounded with cement or powder; Efficiency—creates useful heat in ratio to current used. Holds heat longer due to excellent insulation. Lower cost replacements. Practically immune to burnout. The foremost advancement in surface burners.

Super-Speed-Heet and "Lo-Low"

Standard's economy burner "LO-Low" is now ready and each range has one. This gives you a more economical medium and low heat. We have been experimenting for some time to determine the best heat for medium and low and have found that in most cases the regular heats, half for medium and quarter for low are best. But there are many times that it is necessary to get a lower low heat. Our new "LO-LOW" gives you this.



The picture shows how the new Super-Speed-Heet is made. Note the insulating pad which retards downward travel of heat, thus concentrating heat in the cookery. The variety of surface plate combinations on Standard is unlimited.

Complete Kitchens

This shows a complete kitchen installed by The Geo. H. Eberhard Company, San Francisco, Standard's Northern California distributor. This company has a beautiful kitchen setup in its display and many dealers are falling in line. Dealers who have installed kitchens for their own displays show a decided increase in business on ranges and refrigerators.

Listenwalter and Gough in Los Angeles are following the same procedure with Louis Singleton in charge of the All-Electric Kitchen Department. Two installations which run over $3000 have already been made, in addition to other smaller ones.

Your Share—Plus or Minus?

As this is written, we have just given orders to go on full twenty-four hours time, three shifts in two departments. We have added more factory space. The reason is an earlier rush of business than last year.

This means that the public is buying, which means that the dealer is selling ranges.

Will you get your share or more? You can double your range business this year. Get the Standard new 1936 data right now. Write us direct or get in touch with your distributor.

Get These Now

Get the No. 36 catalog. Get the Sales Manual. Get "Should I Handle Electric Ranges". Get S165, the list of Standard sales helps. The address is Standard Electric Stove Company, Toledo, Ohio.

"Probable Cost" of Power From Bonneville Told

First comprehensive study of the possible cost of power from the federal development at Bonneville on the Columbia River to be publicly released appears in a report of the State Planning Board of Oregon. The report, issued by the Board's Advisory Committee on Power headed by J. C. Stevens of Stevens & Koon, consulting engineers, Portland, makes certain assumptions relative to the development of power at Bonneville and the absorption of this power in the tributary transmission area, and finds minimum costs, including generation and transmission, of energy delivered at 37 load centers and distribution points in Oregon. The report was prepared from data furnished by the office of the North Pacific Division of the Army Engineers constructing Bonneville, Col. T. M. Robbins, Division Engineer.

The report makes it plain that the costs arrived at are the result of applying certain theories to certain assumptions, and that they "have no official standing." It states, however, that these costs represent the probable minimum at which power can be delivered to the receiving substations unless some further subsidy is provided by the federal government "in addition to that of navigation assuming part of the capital cost." The findings are held out as an answer to the "inquiry in the minds of a number of outlying communities and utilities as to whether they should proceed to develop local power resources or wait for power to be supplied from Bonneville."

Chief assumption on which the costs are based and from which they logically proceed is that the total saleable output of the ultimate capacity at Bonneville, 432,000 kw., will be distributed to 51 substations within 15 years from the beginning of the operation of the plant. This contemplates the ultimate absorption of 2½ billion kw.-hr., or more than twice the volume generated in the territory under consideration during the maximum year of record. These 51 substations are located at load centers mostly within a 200-mile radius of the Bonneville project in Oregon and Washington. Thirty-seven lie in Oregon and of these 7 fall outside the 200-mile radius. Transmission lines at 110,000 to 33,000 volts, depending upon the size of the load and the distance transmitted, are assumed to reach these points. The report concerns itself only with detail costs at the Oregon substations.

A further assumption is that half the cost of the dam, fishway and reservoir, and all the cost of ship locks, amounting to nearly $19,000,000 are charged off to navigation, the balance being charged to power. This allocation of the initial cost of the project, plus an estimated amount for the ultimate installation of 10 units of 43,200 kw. each, brings the total cost to $46,000,000 including interest during construction. The annual cost charged to the generation of power includes 4 per cent interest on this capital cost; amortization of the capital cost over a period of 50 years; an annual replacement fund to restore equipment that may become obsolete or worn out before the expiration of the 50-year amortization period; maintenance and operation; and carrying costs of the unused generating facilities over the 15-year load absorption period.

Capital cost of the transmission system reaching the 51 receiving stations is estimated at $43,270,000 as of the date of its completion. This includes 1,900 miles of line of varying voltages, all of wood pole construction except 100 miles of main line where steel towers are contemplated. Upward of $29,500,000 of this cost are applicable to the 37 receiving stations in Oregon. The annual cost chargeable to transmission of the power assumed to be sold in wholesale blocks to these stations includes interest at 4 per cent on the capital cost of that portion of the transmission system completed and in operation; amortization of the capital cost at the end of 50 years from the beginning of operations of the Bonneville plant; annual replacement fund to restore equipment that may become obsolete or worn out before the expiration of the 50-year amortization period; and maintenance and operation.

Another assumption is the pro-rated distribution of the power to each of the receiving stations in proportion to the present use within the area tributary to each. The sum of the estimated demand kilowatts is 525,000, but the report points out that there will be a diversity of demand between substations. Use of power at these points is figured on a 40 per cent load factor basis.

Based on these assumptions a schedule for firm power at the high-side of the step-up transformers at the plant is set up, "not as one to be followed in rate making, but as one that will produce sufficient revenue to meet the obligations imposed by the assumptions." This schedule is: 60c per kw. of demand per month plus an energy charge of first 100,000 kw.-hr. per month at 3 mills, next 200,000 at 2 mills, next 700,000 at 1 mill, all over one million at .5 mill. This schedule will produce average costs of generation for various demands, based on 730 hours per month, as follows:

Demand—kw.	Mills per kw.-hr. at 40 per cent Load Factor
100	5.055
1,000	4.397
5,000	3.171
10,000	2.863
25,000	2.678
50,000	2.616
75,000	2.596
100,000	2.586

Applied to indicated demands, these generation costs run from 2.57 mills for the Portland area with a demand of over 190,000 kw. to 4.67 mills for Burns with a demand of 560 kw. Other generation costs for important load centers are: Salem, 2.64 mills; Eugene, 2.76; Medford, 2.76; Klamath Falls, 2.66; The Dalles, 3.17; Bend, 3.45; Baker, 3.64, and Astoria, 2.84.

In figuring transmission costs to add to generation cost to find the cost at the low side of the substation, two theories were employed and designated Plans I and II.

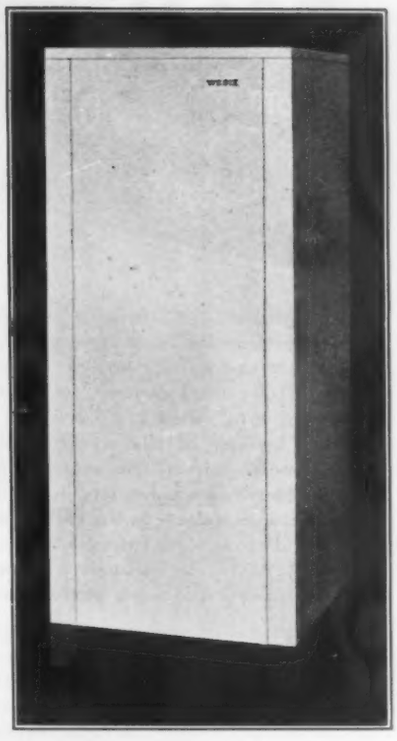
In Plan I, similar in theory to the method used by the Ontario Hydro-electric Commission, each substation is assumed to carry its proportionate share of the capital cost of the transmission system as well as its share of the annual charges, the allocation to substations being based on their peak demands and their relative distances from the point of generation. This produces widely varying transmission costs ranging from 1.07 mills in Portland to 3.781 cents in Burns, farthest point from the plant and having one of the lowest demands.

Under the other plan, embodying the theory employed by the Tennessee Valley Authority, the capital and annual costs of the transmission system within the entire territory have been lumped and the resulting unit cost per kw.-hr. applied equally to all points in the territory. This unit cost is 2.57 mills per kw.-hr. The effect of this method is to subsidize the outlying and low-demand districts at the expense of the nearer and larger power consuming points.

Illustrating the effect of these plans of cost allocation in different localities, the report points out that under Plan II the cost of delivered energy at Portland would be 40 per cent higher than under Plan I. Since distribution costs, which are not included in the analysis, "represent by far the greater part of the total cost to the ordinary customer, his cost is not increased in any manner commensurate with the increase in cost of delivery to the substation. The overall cost for the residential customer in Portland might be about 7 per cent higher under Plan II than Plan I." In the case of a large industrial plant with a high load factor, however, in which the distribution cost is comparatively negligible, the report states that the increase might run as high as 35 per cent.

WESIX FEATURES KEEP 'EM SOLD

Their *Style* SELLS them FAST



New WESIX Kitchen Heater
What a beautiful portable electric heater to sell for the All-electric Kitchen! Has three patented chimney-like Units around which the efficient heating coils are supported their entire length on shelves or ribs. Aluminum Finish with Black Enamel Ends and Ebony Handles. 3000 watts. They don't burn out.

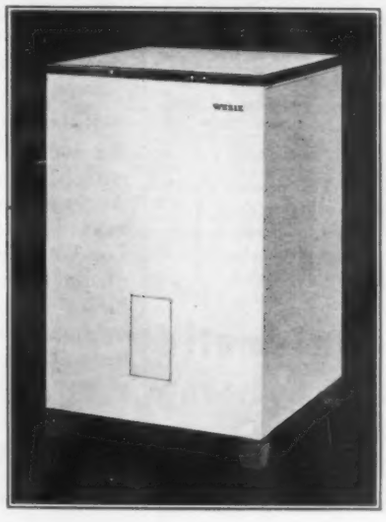
Here's More Profits, More Revenue, More Wiring Jobs!

YES SIR! The Electric Utilities, the Dealers, the Salesmen and the Wiring men all CHEER the new Wesix Automatic Electric Water Heaters.

They harmonize in the modern kitchen. They sell FAST on appearance alone. Best of all, their outstanding features keep them sold!

Where else can you get the patented Duplex Figure "8" Heating Element which presents a large surface to the water being heated—the Positive Pure Silver Contact KERCHER Thermostat — Highest Efficiency Insulation—Tanks of 10-year Guarantee—Non-corrosive Copper and Bronze Fittings—Built-in Heat Trap—Cold Water Diffuser and More Features as only Wesix, the pioneer electric water heater manufacturer, knows how to build them!

Here's the answer to more sales, more revenue.



New Style WESIX Water Heaters
Everything is enclosed in the new Square Model WESIX to present a neat exterior which harmonizes with the modern kitchen. Fully insulated, of course, and possessing all the famous Wesix features!

WESIX ELECTRIC HEATER CO.

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WE SELL
PRIVATE TELEPHONE SYSTEMS
From Two Telephones To Two Thousand Or More Complete Systems From $12 Up

Now, for the first time in telephone history, the electrical merchandising fraternity can sell a complete series of private telephone systems to meet all requirements. Under a new plan arranged by one of the world's largest telephone manufacturing organizations, every electrical wholesaler, dealer and contractor can share in the tremendous potential market for interior telephone systems with exceptionally generous compensation for such participation.

The telephone systems include the nationally-advertised Strowger P-A-X's (Private Automatic Exchanges), Autelco Intercom. Systems, and Serv-U-Fone Systems. They range, in capacity, from 2 to 2000 telephones, and more — prices, from $12 up.

If you are a recognized and aggressive electrical wholesaler, dealer or contractor, write for specific details of this new plan.

Autelco Private Telephone Systems are designed for private service. They cannot be connected with the public telephone system.

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...about People

Chamberlain Heads San Diego Electric Club

J. Clark Chamberlain, for the past three years executive secretary of the Bureau of Radio and Electric Appliances of San Diego County, was elected president of the San Diego Electric Club at that organization's annual banquet held at the U. S. Grant Hotel, last month. Chamberlain succeeds R. C. Cavell, engineering department head of the San Diego Consolidated Gas and Electric Co. Walter Chapman, also of the electric utility was elected first vice-president; Francis Irwin, Coast Electric Co., second vice-president; and Ray Edwards, safety director of the utility, secretary-treasurer. Members of the new board of directors include Ben Rogers, Firestone Service; Truitt Richardson, utility; Harvey Watt, Thearle Music Co.; Wm. Gill, Gill Electric Co.; and Ray Cavell, past president.

According to Chamberlain the most important objective of the club during 1936 will be active promotion of spectacular events in connection with the Palace of Electricity at California's Exposition. Arrangements are already under way for the staging of a unique and impressive tribute to Thomas Alva Edison as an outstanding feature of the Exposition. The club is in contact with members of the famous Edison Pioneers Club which has promised the closest kind of cooperation.

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• EDGAR A. LOEW, professor of electrical engineering at the University of Washington, a position which he has held since 1909, has been appointed dean of the College of Engineering. He will continue his regular teaching duties. Professor Loew is a graduate of the University of Wisconsin class of 1906. On graduation, he taught electrical engineering until 1909 when he moved to Seattle.

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• ROBERT G. LINDERMAN, formerly of the Incandescent Lamp Division, General Electric Co., working out of Los Angeles, particularly on studio business, left Los Angeles to become the London and continental representative of the Moe-Richardson Co., manufacturers of moving picture studio lighting equipment at Los Angeles. He will be general manager of the London branch of this equipment manufacturer.

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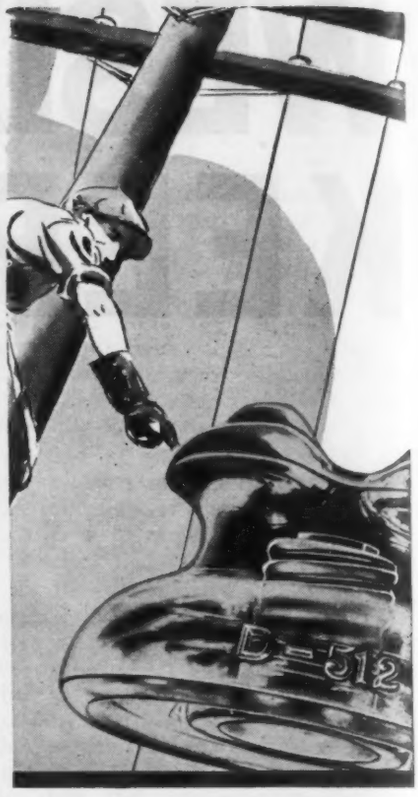
• F. C. ANGLE has been appointed manager of the San Francisco Allis-Chalmers district office.



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Hemingray Adds to its Long List of Advantages

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2. Greater mechanical strength.
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4. Unaffected by sudden temperature changes.
5. Withstand maximum insulator pin expansion.
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Owens-Illinois Glass Company, Hemingray Division, Muncie, Ind.

HEMINGRAY Glass INSULATORS

• WILL H. DAVIE, vice-president for the past 10 years in charge of the southern California division for Allied Industries, Inc., manufacturers' representative, has succeeded William Greenfield, who died last month, as president of the company. In assuming the new position Mr. Davie will continue to manage the Los Angeles branch and devote most of his time to that region. No other changes in the personnel of the organization are contemplated. With the full staff maintained throughout the depression, a slight shifting of responsibility is expected to care for the various activities of the company in representing all of its major lines of wiring materials and supplies. The company now represents the Youngstown Sheet & Tube Co., Collyear Insulated Wire Co., Porcelain Products, Inc., Roach-Appleton Co. and Schwarzee Manufacturing Co., as well as lines of smaller items, in Portland, Seattle, San Francisco and Los Angeles, with a main warehouse in San Francisco. Mr. Davie is vice-president of the Ben Franklin Club in Los Angeles and active in industry activities.

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• PIERRE VINET, for many years commercial manager of the Coast Counties Gas and Electric Co., Santa Cruz, has become commercial manager of the Michigan Gas and Electric Co., at Holland, Michigan. Before leaving California Mr. Vinet served a term as chairman of the Commercial Section of the Pacific Coast Electrical Association.

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• WILLIAM P. SWARTZ, Pacific Coast sales manager of the Standard Electric Stove Co., has returned to the Coast after an extended visit at the company's factory at Toledo, Ohio.

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• R. C. LAMPHIER, president of Sangamo Electric Co., Springfield, Ill., spent most of the last month on the Pacific Coast on a combined business and pleasure trip.

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• JOHN S. LAPP, president of the Lapp Insulator Co., LeRoy, New York, recently made a combination business and pleasure trip to the Pacific Coast.

• A. VILSTRUP has been appointed chief electrical engineer of the B. C. Electric Railway Co., Ltd. Mr. Vilstrup joined the company in 1911 in its engineering department.

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• HARRY M. THOMAS, formerly with Erwin-Wasey Advertising Agency, San Francisco, has become affiliated with the H. R. Basford Co. as sales promotion and instruction supervisor on Kelvinator refrigerators.

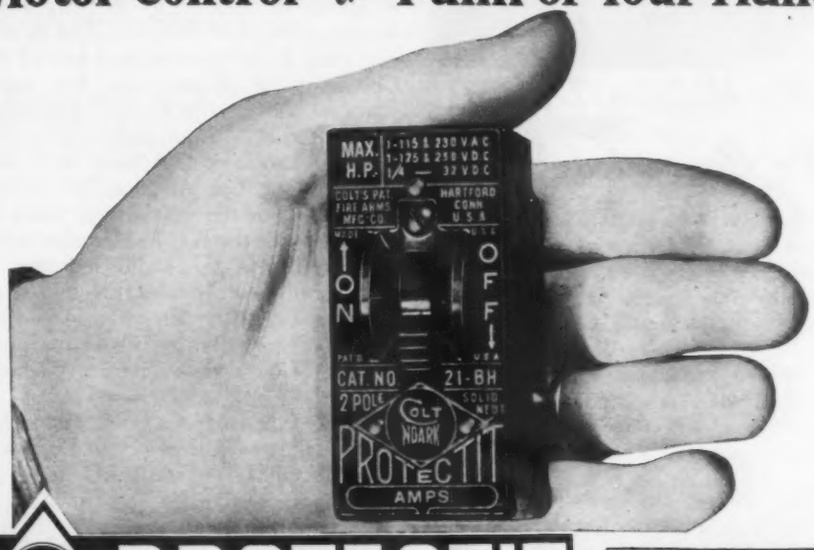
•

• A. D. BROWN has been appointed district manager of Allis-Chalmers Mfg. Co. at Los Angeles to fill the vacancy caused by the sudden death of Boyd Anderson. For many years Mr. Brown has been manager of the company's Buffalo District office.

•

• A. H. KAHN, formerly Pacific Coast operating manager of the General Electric Supply Corp. at San Francisco, has been made district manager of G-E Supply at Chicago. Mr. Kahn started his electrical career with the old Pacific States Electric Co. in San Francisco as an office boy and successively became stock clerk, salesman, purchasing agent, service manager and operating manager.

Motor Control in the Palm of Your Hand



COLT NOARK PROTECTIT

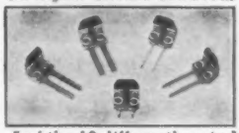
The New Auxiliary Circuit Breaker with a thousand uses!

The PROTECTIT is the newest COLT-NOARK development—a compact, simple switching unit that also provides automatic overload protection. Rugged in construction—built to stand up under continuous operation—and designed to protect motors up to 1 H.P. against damaging overloads. Install the PROTECTIT in homes for operating and protecting small motors on washing machines, oil burners, refrigerators and other electrical appliances. For industrial use install the PROTECTIT on machines and tools for motor control and protection.

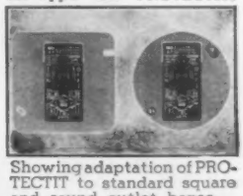
PROTECTIT in steel box. Flush or surface mounting.

Two types are available—Type "B" with fixed ampere rating and Type "BH" adapted for using any one of nineteen differently rated heaters. The switching is dualbreak—and automatic overload protection is accomplished by a bi-metallic latch. The Toggle type operating mechanism is unusually simple and the handle entirely trip free. The PROTECTIT is completely enclosed in an attractive molded casing.

Type "B" PROTECTIT shown above on left. Type "BH" on right. Covers removed.



5 of the 19 differently rated heater elements available for Type "BH" PROTECTIT.



Showing adaptation of PROTECTIT to standard square and round outlet boxes.

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.
ELECTRICAL DIVISION
H. B. SQUIRES CO., Pacific Coast Representative

COLT-NOARK
SWITCHES - MOTOR STARTERS - FUSES

No Hidden Defects
No Concealed Flaws

When steel of tested analyses is cast into ingots, there devolops during the cooling process, a shrinkage or hollow along the top that is surrounded with unsound material. By rolling operations and grain refinement this undesirable material is forced to the end section where it is cropped off and discarded, leaving the perfect section for the forging billet.

Now scrutinize the forging process closely. These billets are reheated and the hammer descends to force them to shape. Any folds developed during this process are forced out into the flash (excess material) and then trimmed off. Does the claim of hidden defects and concealed flaws seem illogical?

THE BREWER-TITCHENER CORPORATION
Cortland, New York

Through Your Insulator Manufacturer Only

For Reliability, Specify a Drop Forging

• SETH M. BULLIS, safety engineer for The California Oregon Power Co. for the past several years, was appointed to be manager of the Medford district of that company to succeed J. C. Thompson, deceased. Mr. Bullis graduated from Cornell University with a degree of electrical engineer in 1908, and for the next five years was connected with the Vicksburg Light and Traction Co., of Vicksburg, Miss., coming to Medford in 1913 to be associated with his father in the Southern Oregon Traction Co. This was a short lived venture, and after 1½ years as electrical superintendent of the St. Cloud Public Service Co., at St. Cloud, Minn., he joined The California Oregon Power Co. as division superintendent in 1918.

•

• MARK E. SMITH, of R.C.A. Manufacturing Co., Los Angeles, died in that city Feb. 16, 1936. A graduate of the University of Washington, for many years he was Pacific district sales manager of the E. T. Cunningham Co., Inc., of San Francisco, and later with Ray Thomas Co., Los Angeles, as general manager. For the past several years he has been with the R.C.A. Manufacturing Co. Active in the radio industry as well as in Los Angeles Electric Club and San Francisco Electrical Development League activities, he is mourned by a host of old time friends.

•

• BOYD ANDERSON, for the past twelve years connected with the Allis-Chalmers Mfg. Co., at Los Angeles, Calif., died suddenly Jan. 18 at his home in Alhambra, Calif. He was 43 years of age. His death followed a heart attack. Mr. Anderson, who recently had been appointed Los Angeles district manager for the company, after serving for several years as sales engineer, formerly was connected with the Crocker-Wheeler Company in San Francisco. He was born in Maryland, lived for some time in Denver, Colo., and entered the electrical industry in San Francisco.

•

• EDWARD A. QUINN, former general superintendent of the San Joaquin Light and Power Corp., died in Fresno last month following an attack of pneumonia. Prior to his resignation because of ill health in April, 1934, Mr. Quinn served as general superintendent of the company for twenty years. He was born in Montreal, Canada, and attended McGill University.

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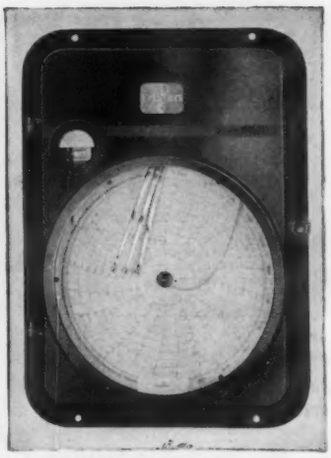
• J. C. THOMBSON, district manager of The California Oregon Power Co. at Medford, died in January after an illness of about two months. He had been with the company for twenty years, and had managed the Medford district for ten years.



Meters Flow *precisely*

in severe field service

Employing the widely accepted orifice and mercury manometer system of flow measurement, this Bristol's meets the needs of industry for a rugged, accurate and reasonably-priced mechanical flow meter. Even under severe field conditions it can be counted on to give precision measurement.

Meter body is of forged steel, with stainless steel parts inside mercury chambers. Connections are welded or mechanical. The stuffing box is of hardened stainless steel. Grease-packed, it is absolutely leak-tight.

Check valves, operating by gravity, prevent the loss of mercury. A bushing, inserted in the line between the two chambers, dampens the effects of pulsations. Meters for working pressures of 1000 lbs. are tested at 2000 lbs. Special bodies tested at 5000 lbs. are available for working pressures up to 3000 lbs. Write for Bulletin 425.

Illustration above shows Bristol's Recording Flow Meter, Model 1160 MF.

THE BRISTOL COMPANY
Branch Offices: Rialto Bldg., San Francisco
747 Warehouse St., Los Angeles
Branch Factory: 311 Minna St., San Francisco

TRADE MARK
BRISTOL'S
REG. U. S. PAT. OFF.

ECONOMIZE

With JEFFRIES

Air Cooled Transformers

YOU can inaugurate many plant economies with the efficient and dependable Jeffries Air Cooled Transformers. These transformers simplify plant distribution systems by eliminating the expense of long secondary conduit runs and providing voltage change at the point desired. Jeffries transformers are available to meet all requirements with special design made to order. Type S.S. transformer, 50 to 250 watts shown above.

JEFFRIES TRANSFORMER COMPANY
5706 Long Beach Ave., Los Angeles

New Wholesale Firm Organized in Spokane

Brown-Johnston Co., leading Spokane electrical firm, has opened a new building and announced the establishment of an entirely separate business to be known as the Brown-Johnston Wholesale Co.

According to Eric Johnston, president of the company, the new firm will operate entirely as a wholesale unit, with separate organization. The present store of the company will operate as a retail establishment and will be completely remodeled and modernized.

Special plating, manufacture of fixtures and lamp shades of all types will be featured at the new plant. Departments in the new wholesale house will handle radio, air conditioning and commercial refrigeration supplies.

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• SUNSET ELECTRIC CO., Seattle, Wash., has been appointed distributor in Washington for the Philco Radio and Television Corp.

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A Clean Sweep

Far Westerners won practically all of the grand award trips to the General Electric appliance and merchandising department at Bridgeport, Conn., by unprecedented sales of home laundry equipment and vacuum cleaners during the past year. In fact, eleven out of the seventeen who won the award came from the eleven Western states. These included E. Jacobson, G. A. Lobenberg and C. R. Harris, of San Francisco; O. R. Miller and J. D. Pulsifer, of Portland, Ore.; V. Harrison and J. Tilley, of Seattle; R. S. Belnap and J. L. Schricker, of Salt Lake City and L. M. Burdick of Butte. In the photograph, standing, are J. Tilley, E. Jacobson, C. R. Harris, Dean Pulsifer. Seated are Verne Harrison, G. A. Lobenberg, and Oscar Miller, from the Far Western states just prior to embarking from San Francisco for the trip. Their visit included a discussion of promotional plans for the year presented by Messrs. Spooner, Cordiner, Turnbull, McIver, Wicht and Atkinson, of the Bridgeport factory

• WINNERS of a gold watch in the Factory "B.T.U. Club" of Frigidaire Corp. for the Oakland district were Paul Charron, of Shirar Young Co.; T. F. Lofberg, John Breuner Co.; G. H. Ferguson, also John Breuner Co.; D. C. Poulsen, Santa Rosa department store and A. E. Hamilton, Farmers Union, San Jose. Separate awards were made on what was known as the "Robertson Quota Club" to dealers as follows: Barker-Tilton Co., Alameda; Cranston Brothers, Woodland; G. M. Hickman, Orland; Crolona Furniture Co., Crockett, and Lustig Furniture Co., Hayward.

•

• ACE WASHING MACHINE CO., of 2517 Whittier Blvd., Los Angeles, an electrical household appliance retailing firm, has been purchased by Louis Simon. Mr. Simon for the past 2 years has operated an appliance store in Pasadena known as the Kelvinator Pacific Co. In addition to the store Mr. Simon has purchased the Ace Wringer Roll Co. which manufacturers all types of wringer rolls as well as washer replacement parts. He plans to reorganize and expand the manufacturing department.

•

• CHALKERS APPLIANCE SHOP is a newly opened electrical appliance store at 6812 Pacific Blvd., Huntington Park, Calif.

We Are In Business

TO GIVE

SERVICE

GEO. E. HONN COMPANY
420 Market St., San Francisco, Cal.

Manufacturers Representatives for

Tree Trimming Equipment
- Bartlett Manufacturing Co.

Friction and Rubber Tapes
- Clifton Manufacturing Co.

Pyrex Insulators
- Corning Glass Works

Transformers
- Gardner Electric Mfg. Co. *Power and Distribution Transformers*
- Lee Skipwith & Co. *Niagara-Air Insulated Current Transformers*

Poles and Cross Arms
- Mineralized-Cell Wood Preserving Co.
- Pacific Cross Arm Corp.

Fuses, Cutouts, Protective Devices
- Schweitzer & Conrad, Inc.

Modernize Ranges with

CHROMALOX

Super-Speed
RANGE UNITS

Four sizes of these popular, fast-cooking units will fit every range you may be called upon to service. Big saving in inventory. Flat metal top, no exposed wires, long life, few "trouble calls".

Successful range modernization campaign fully explained in new illustrated "Chromalox Plan" book. Ask our nearest representative or write us.

EDWIN L. WIEGAND CO.
PITTSBURGH, PA.

Represented by

MONTGOMERY BROTHERS
911 Western Ave., Seattle, Wash.
524 S. W. Pine St., Portland, Ore.
61 Fremont St., San Francisco, Calif.
912 E. 3rd St., Los Angeles, Calif.

THE PETERSON COMPANY
1921 Blake St., Denver, Colo.

Crapo
GALVANIZED PRODUCTS

Where strains and stresses are heaviest, where corrosion takes its greatest toll, *Crapo* Galvanized Steel Strand and Telephone Wire long ago demonstrated their outstanding superiority. The heavy *pure* zinc galvanized coating, maximum tensile strength and proper ductility insure longer life and lower maintenance cost. Insist upon *Crapo* Galvanized Products for better performance under all conditions!

Indiana Steel & Wire Co.
Muncie, Indiana

Crapo Galvanized Products are available in all standard grades and sizes.

• TOPPERS—Instead of a trip to some distant point, usually the factory, the Toppers Club of General Electric salesmen making the highest percentage of quota for the Pacific Coast and Rocky Mountain districts was given a week's outing at Del Monte from Feb. 18-21. From 65 to 75 top salesmen were present from the various distributors organizations of General Electric appliances. Ralph Cameron, assistant to the manager, specialty appliance division in Cleveland, and Jean de Jen, campaign manager of the Toppers Club, also of Cleveland, were guests of George Ruck, factory representative, and gave the Toppers a short business session in the midst of the vacation program. Freeman Chambliss, Bakersfield, was elected chairman of the Toppers organization of the West.

•

• DROPPING the name of Drendell from the combined name Drendell-Trumbull Electric Co., the Pacific Coast organization now will be known as the Trumbull Electric Manufacturing Co., Inc. as distinguished from the home organization at Plainville which does not have the "Inc." added to its title. Personnel and management remain the same. The move eliminates a name long known to switchboard and panelboard buyers on the Pacific Coast. Originally started as the Drendell Electrical Manufacturing Co., it was acquired by the Trumbull organization several years ago and has carried the joint name until this last move.

•

• FIVE MEMBERS of the Maydwell & Hartzell organization attended the James R. Kearney Corp. sales conference held at St. Louis, Mo., in January. Included were Harry F. Hartzell, vice-president and general manager; H. S. DeLancie, sales engineer; R. G. Harris, San Francisco District Manager; E. S. Condon, Los Angeles District Manager; and E. I. Hannah, Los Angeles District sales engineer.

•

• ELECTRIC MOTOR DEALERS ASSN. of Northern California, Inc. held a stag party and entertainment at Hotel William Taylor Feb. 7. The occasion was to pay respect to the new president, Louis Douat, Buzzell Electric Works, and to the immediate past president, Frank Boyd, Pacific Electric Motor Co. E. J. Douglas was chairman of the committee in charge.

•

• POWERS FURNITURE CO., Portland, installed one of the largest and most complete displays of electric ranges of any single make to be found anywhere on the Pacific Coast. The occasion was the introduction of the 1936 line of AB electric ranges.

• ROBERT W. GRIFFIN has taken over the business of the Crown Electric Co., 153 Eddy St., San Francisco, formerly operated for many years by the late B. L. Zellensky. Mr. Griffin, a graduate in electrical engineering at the University of California, has been the San Francisco manager for the Scott Buttner Electric Co. of Oakland for the past several years, conducting its San Francisco branch. When that branch was closed by the Scott Buttner Electric Co. Mr. Griffin took over the business of Crown Electric which he is operating himself. He has been prominent in Electrical Contractors Assn. activities, particularly as chairman of the data committee.

•

O. E. CURRENT, for 8 years located at Inglewood, Calif., has opened a new appliance store at 229 East Queen St., Inglewood.

PROFESSIONAL SERVICES

ELECTRICAL TESTING LABORATORIES

Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.

80th St. and East End Ave., New York

ARTHUR R. KELLEY
CONSULTING ENGINEER

Reports and Valuations, Public Utility Industrial Properties

Edison Bldg. Los Angeles

Classified Section

• COST of undisplayed classified ads is 5 cents a word, minimum $1.00 insertion. Box numbers in care of our San Francisco office count as 10 words additional in undisplayed ads.

• RATES per column inch of displayed ads is $3.75.

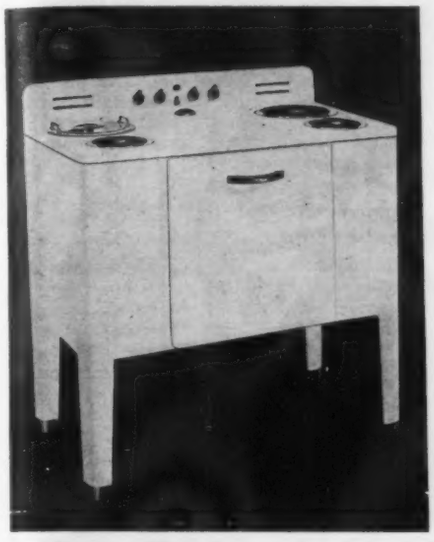
• ALL classified ads are payable in advance.

ELECTRICAL WEST 883 Mission Street San Francisco, Calif.

POSITION WANTED—Electrician, steadily employed, desires change in location, preferably Southwest. Has constructive record in generating and substation operating with some building maintenance experience. Married and small family. Age 45. Native born with a good background education. Out-of-town position acceptable if not too far from school. Address Box 55, Electrical West, 883 Mission Street, San Francisco, California.

POSITION WANTED—Man with electrical and mechanical training and having creative ability wants position with growing West Coast manufacturer. Past experience traveling for Eastern pioneer oil-burner concern, training personnel for dealers and distributors. Aptitude best suited for work with problems arising in the development and introduction of new products. Address Box 65, Electrical West, 883 Mission Street, San Francisco, Calif.

...in New Equipment



Low Priced Ranges

Priced to list for less than $100.00 and designed to reach the low priced market, the new "Dorian" electric range is included among 3 new models just announced by the Edison General Electric Appliance Co. for 1936. Greater oven capacity, a new and striking design, which is a departure from conventional models, and a new arrangement of switches and automatic temperature control are among the features of the range. The oven is placed in the middle and control switches for heating units are mounted on the back flasher. The table top work surface is in the center with surface units on either side. Other new models are the Stratford and the Belmont. The former is a full sized family range in white porcelain enamel and the latter a deluxe table-top model in white or cameo ivory porcelain.

●

Condit High Speed Circuit Breaker

Condit Electrical Manufacturing Corp., Boston, Mass., has introduced a new indoor oil circuit breaker known as type DX-20 equipped with expulsion ports for high speed efficient interruption. Additional features include a high speed enclosed mechanism, sturdy frame construction with deep overhanging flange, all poles in one tank, Bakelain bushings, oil and gas separator and heavy arcing contacts of large thermal absorption capacity. The new breaker is furnished for 600 amp. at 15 kv., 1,200 amp. at 7½ kv. and 2,000 amp. at 5 kv. It has an interrupting capacity rating of 50,000 kva. It is flexible in its mounting arrangements and may be manually, solenoid or motor operated.

●

Chance Anchors For Rural Lines

Chance Co., Centralia, Mo., has announced two new anchors for light rural line construction. The Thimbleye screw anchor consists of a high grade malleable iron helix casting wedged onto a triple eyed steel rod. The eye in the rod is long enough to permit the use of a small rod as a wrench. The Ozark expanding anchor has ⅛ x 2½-in. steel blades with an expanded area of 16 sq. in. The anchor is expanded by turning the rod after the anchor is dropped into the hole.

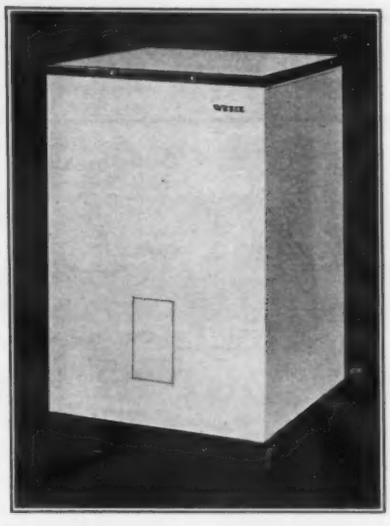
Frigidaire Announces 1936 Models

Styled to harmonize with the modern trend and incorporating a new hermetically sealed mechanical unit known as the "meter-miser," sixteen refrigerator models have been announced by Frigidaire for 1936. These include the Imperial and Premier models for the luxury market, the Super series, porcelain enamel on steel, and the Master series, dulux on steel. The new mechanical unit comprises only three major moving parts which are permanently sealed in oil. A food safety indicator for determining instantly the exact temperature in the food compartment is standard equipment. Many radical new improvements have been built into the line to increase its saleability and useability.

●

Wesix Builds Square Water Heaters

To harmonize with the modern trend in kitchen equipment the Wesix automatic water heaters, manufactured by the Wesix Electric Heater Co., San Francisco, Los Angeles and Seattle, have been restyled in square types of



three different sizes. The new heaters incorporate all of the outstanding features of the round Wesix water heaters. They are available in various colors to harmonize with other kitchen equipment. Standard finish is white with black trim. The table top model available only in 30-gal size fith a 2,500-watt unit is equipped with a top of white acid-resisting porcelain and is also available in monel or duco. Tall square models 60 in. in height are available in 30- or 40-gal. sizes with single or double heating units.

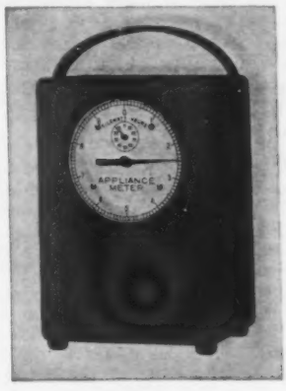
●

Bull Dog Safety Switch Features New Principle

Bull Dog Electric Products Co., Detroit, Mich., has announced a new safety switch known as the "Vacu-Break." The design reverses the conventional procedure and puts the arc extinguishing structure on the moving contact or blades instead of on the jaws. The arc extinguisher is made in the form of a partitioned chamber totally enclosed except for two slots at the bottom to receive the dual stationary contacts in separate cells. The piston action of the contacts when rupturing in this close-fitting arcing chamber tends to evacuate the small amount of air present, thus minimizing burning of the arc chamber or the contacts. Both switch and handle have been styled in the modern vogue.

Duncan Meter to Measure Appliance Consumption

Duncan Electric Co., Lafayette, Ind., has placed on the market an appliance meter which consists of a watthour meter especially designed for measuring the amount of electrical energy consumed by an appliance during any desired period of time. It can be



utilized by utilities and dealers as a valuable tool in connection with the sale and service of appliances. A feature of the instrument is the ease and facility with which it can be connected into the circuit. Two circuit connections are located on the back of the case, one outlet receiving the appliance plug and the other outlet being for the circuit connection. The appliance meters are available in two and three wire types. Each type can be supplied with standard or slow moving or special fast moving registers. The scale is guaranteed in tenths from 0 to 10 kw.-hr. with a smaller dial indicating tens of kw.-hr. up to 100.

●

Westinghouse New Companion Range

Announcement is made by Westinghouse Electric & Mfg. Co., Mansfield, Ohio of a new electric range, the A-64, as a companion range to the A-63 model, recently introduced. The new model features a drawer which is mounted on roller bearings and which may be adapted as a warming compartment by the installation of an extra element; new enamel end panels, and beautiful streamlined design. Other details are: three heat load balancing switches, rugged direct acting thermostat, large visable pilot light, positive action door latch, and large aluminum broiler pan. The range has four surface units of the newest type Westinghouse Quick-Cook open type. The finish is of white porcelain enamel with black trim.

New G-E Combination Meter and Time Switch

For metering and controlling domestic loads including offpeak water heating, the General Electric Co. has announced a combination watthour meter and time switch which provides complete metering and control at minimum investment. The new combination device is available in three forms; single-dial register with contacts, double-dial register without contacts. In each case a complete time switch has been designed in combination with a watt-hour-meter register.

●

Everhot Roaster in New Model

Several innovations have been added to the new 1936 model Everhot electric roaster just announced by the Swartzbaugh Manufacturing Co., Toledo, Ohio. Automatic temperature control button, signal light and a thermometer showing at a glance the type of oven heat at every stage of cooking are mounted on a large instrument panel on the front of the roaster. The thermostat is the Spencer disc type which shuts off the current com-

pletely at intervals. To support the dealer's merchandising the company has available new and striking display helps including imitation foods, window display sets and an electrically operated self-demonstrator.

●

Lapp Announces New Insulators

Lapp Insulator Co., Inc., LeRoy, N. Y., has announced a new line of station post insulators which consist of closed-end porcelain posts, to the prepared ends of which caps are cemented to permit mounting and the attachment of the usual switch parts, bus support clamps and other such substation apparatus. The new insulators constitute a similar and parallel development with Lapp line posts for transmission lines. Among the features is freedom from puncture which results from the absence of internal conductive material and the full separation of the live parts of the insulator. Fog type corrugations assure ability to withstand contaminated atmospheric conditions. One of the most valuable features of the design is the fact that these insulators uniformly possess the same strength inverted as when used in upright position, permitting the use of underhung mounted equipment with complete security.

●

Baby Universal Strain Clamp

The Chic Brass Co., Mansfield, Ohio, has introduced a Baby Universal Clamp carrying the same principles of design as its larger Universal Strain Clamp. The primary snub, in combination with a modified "V" wire-groove and a positive clamping member makes this smaller clamp applicable to the range of conductor sizes and types used on rural electrification. It will take No. 6 to No. 2 solid or stranded cables.

WHERE TO BUY IT IN THE WEST

Roller-Smith Company

3 Barclay St., New York City — Works: Bethlehem, Pa.

★ INSTRUMENTS (Indicating and Graphic)
★ CIRCUIT BREAKERS (Air and Oil)
★ INSTRUMENTS AND CONTROL SWITCHES
★ SWITCHGEAR
★ RELAYS

Agents: Electric Material Co., San Francisco and Los Angeles. J. C. McDougall, Seattle. Mark G. Mueller, Denver. T. E. Geary, Omaha

Air Conditioning
Frigidaire Corp.
General Elec. Co.
Graybar Elec. Co., Inc.
Kelvinator Corp.

Ammeters and Voltmeters
Bristol Co.
General Elec. Co.
Roller-Smith Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec. Instr. Corp.

Anchors, Guy
James R. Kearney Corp.

Appliances, Household
Edison Gen. Elec. Appliance Co., Inc.
General Elec. Co.
General Elec. Supply Corp.
Graybar Elec. Co., Inc.
Lindemann & Hoverson Co., A. J.
Malleable Iron Range Co.
McGraw Elec. Co.
National Enameling & Stamping Co.
Waters-Genter Div.
Westinghouse Elec. Supply Co.

Boxes
General Cable Corp.
General Elec. Co.

Bus Fittings
Burndy Eng'g Co.
General Elec. Co.

Brackets, Wood
Locust Pin Co.

Breakers

Air Circuit Breakers
General Elec. Co.
I-T-E Circuit Breaker Co.
Roller-Smith Co.
Sangamo Elec. Co.
Westinghouse Elec. & Mfg. Co.

Oil Circuit Breakers
Allis-Chalmers Mfg. Co.
General Elec. Co.
Pacific Elec. Mgf. Corp.
Roller-Smith Co.
Westinghouse Elec. & Mfg. Co.

Buses
Aluminum Co. of America

Cable Accessories
General Cable Corp.
General Elec. Co.
John A. Roebling's Sons Co.

Cables
Aluminum Co. of America
American Steel & Wire Co.
Columbia Steel Co.
Crucible Steel Co. of America
General Cable Corp.
General Elec. Co.
Graybar Elec. Co., Inc.
Maydwell & Hartzell, Inc.
National Elec. Products Corp.
Providence Insulated Wire Co.
John A. Roebling's Sons Co.
United States Steel Corp.
Westinghouse Elec. & Mfg. Co.

Carbon Brushes
National Carbon Co., Inc.

Carbon Products
National Carbon Co., Inc.

Chimes
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Johns-Manville Corp.

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Clark Controller Co.
General Elec. Co.
Square D Co.
Westinghouse Elec. & Mfg. Co.

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General Elec. Co.
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Wesix, Inc.

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General Elec. Co.

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General Elec. Co.

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General Elec. Co.

Fittings, Insulator
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Malleable Iron Range Co.
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Thermador Elec'l Mfg. Co.
Wesix Inc.
Westinghouse Elec. & Mfg. Co.

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Johns-Manville Corp.

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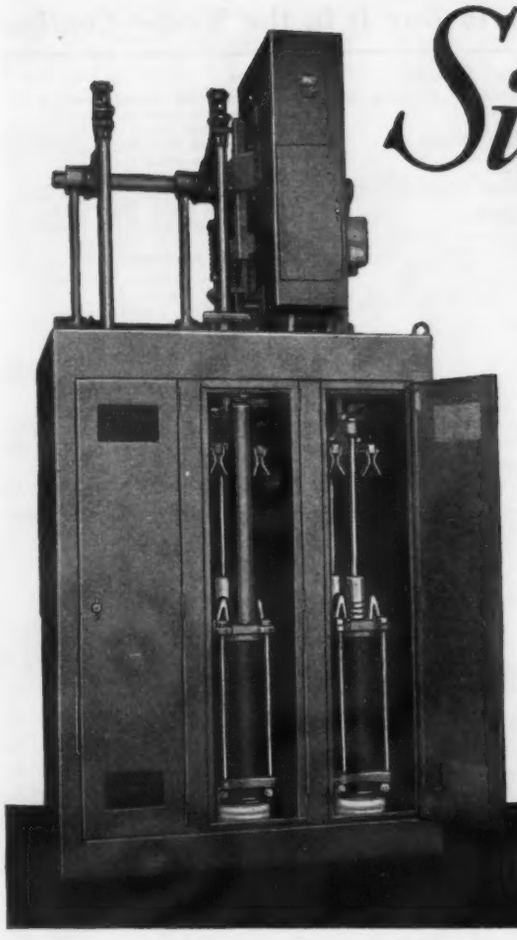
Hemingray Glass Co.
Geo. E. Honn Co.
Lapp Insulator Co., Inc.
McLaughlin Glass Co.
Owens-Illinois Glass Co.
Westinghouse Elec. & Mfg. Co.



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Important Improvements

1903 Explosion-chamber principle applied
1913 Tanks made easily removable
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1930 Trip-free motor operating mechanism introduced
1931 OIL-BLAST added

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Silver current-carrying contacts — reduced maintenance
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GENERAL ELECTRIC

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Lamps, Student
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Lamps, Sun
General Elec. Co.

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Sangamo Elec. Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec'l Instrument Corp.

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General Elec. Co.
Westinghouse Elec. & Mfg. Co.

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General Elec. Co.
Westinghouse Elec. & Mfg. Co.

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Union Oil Co.

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Weston Elec'l Instrument Corp.

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Hubbard & Company
Joslyn Co. of California
Kortick Mfg. Co.
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Pacific Power & Light Co.
Portland General Electric Co.
Puget Sound Power & Light Co.
San Diego Cons. Gas & Elec. Co.
San Joaquin Light & Power Corp.
Southern California Edison Co. Ltd.
Utah Power & Light Co.
Washington Water Power Co.

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Edwin L. Wiegand Co.

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Malleable Iron Range Co.
Standard Elec. Stove Co.
Steiger & Kerr Stove & Fdry. Co.
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General Elec. Supply Corp.
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Kelvinator Corp.
Malleable Iron Range Co.
Westinghouse Elec. & Mfg. Co.

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Roller-Smith Co.

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Northwest Elec. Light & Power Association
Pacific Coast Elec'l Ass'n
Pacific Coast Elec'l Bureau

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Maydwell & Hartzell, Inc.
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Roller-Smith Co.
Square D. Co., Inc.

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James R. Kearney Corp.

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General Elec. Co.
Meter Devices Co.

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Colt's Patent Fire Arms Mfg. Co.
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Westinghouse Elec. & Mfg. Co.

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Aluminum Co. of America

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Pelton Water Wheel Co.

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General Elec. Co.
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Sangamo Elec. Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec. Instrument Corp.

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Pelton Water Wheel Co.

Wire
Aluminum Co. of America
America Steel & Wire Co.
Columbia Steel Co.
Crescent Ins. Wire & Cable Co.
Crucible Steel Co.
General Cable Corp.
National Elec. Products Corp.
United States Steel Corp.
Westinghouse Elec. Supply Co.

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Associated Sales Engineers
Bryant Electric Co.
Gen. Elec. Supply Corp.
Graybar Elec. Co., Inc.
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Hart Mfg. Co.
Indiana Steel & Wire Co.
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Pacific Wire Rope Co.
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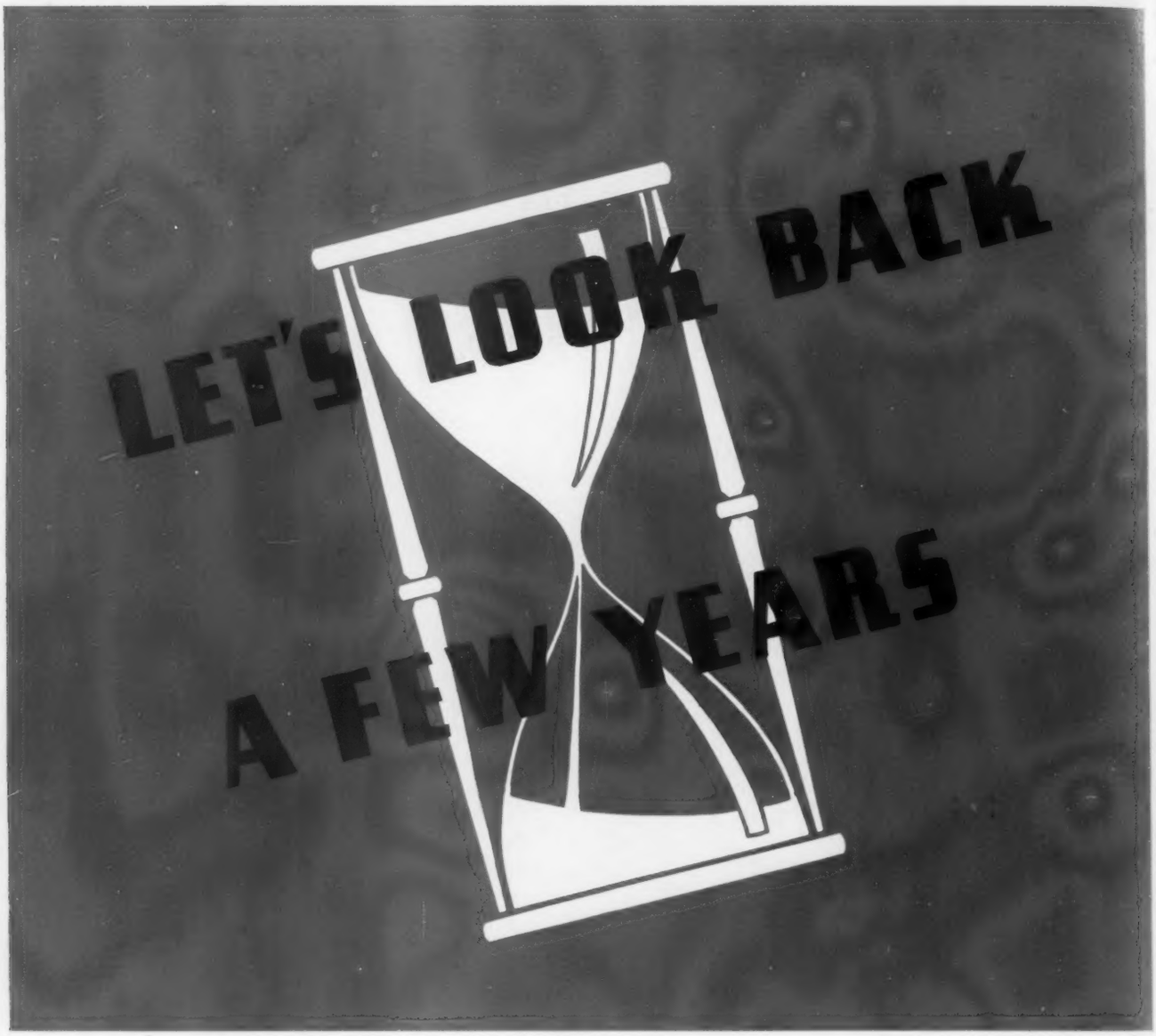

It wasn't so long ago that radios, air-conditioners, electric ranges, water heaters and refrigerators and other appliances were only wild dreams.

Today—within a span of a few short years—they have become very definite realities, taking their place with the necessities of life. But what has been accomplished is only a forecast of what we may expect in the coming years.

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